THE MARINE RECORD

ESTABLISHED 1878

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THE LAKE CARRIERS' NEW PRESIDENT.

(SEE ILLUSTRATION.)

Capt. J. J. H. Brown, the newly chosen president of the Lake Carriers' Association, is a native of Ohio, having been born in Cleveland in 1838. He began sailing on the Great Lakes at the age of 12 years, and when he approached young manhood, spent three or four years at sea. He then returned to the lakes and sailed until 1877, being in command of vessels during the last 12 years of that period.

In 1877, Capt. Brown decided to remain permanently on shore, and entered the vessel brokerage business at Buffalo with Daniel Rodgers, under the firm name of Rodgers & Brown. In 1885 Capt. Rodgers died, and the firm has since continued under its present name of Brown & Co.

Ever since the present organization of the Lake Carriers' Association. Capt. Brown has been prominent and active in the association's work at the foot of the lakes. He is peculiarly adapted for solving knotty problems, and for overcoming apparently insurmountable difficulties. To his untiring efforts and unremitting watchfulness was due chiefly the success of the Lake Carriers' two great crusades in Buffalo—against the excessive charges made for shoveling grain, and against the fueling abuses practiced by coal shippers. His tact is so remarkable that his insistence in these matters was felt no more than is the pressure of the atmosphere about us, but it performed as great results as does that atmosphere when compressed and directed in an effective manner. The brokerage firm of Brown & Co. is one of the most extensive of its kind in Buffalo, and its bulletins and predictions in freight matters are looked upon as the highest authority. Capt. Brown is eminently qualified for the duties of the position he has been selected to fill, and members of the association may rest assured that he will perform his executive duties in a manner at once thorough, conservative and wise.

CAPT. J. H. H. BROWN,
President for 1896 of the Lake Carriers' Association.

THE DAM PROJECT INVESTIGATION.

The full text of the bill introduced by Senator Brice, on the 3rd inst., is as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the committee heretofore appointed by the President, under and by virtue of the provisions of the sundry civil act of March 2, 1895, chapter 189, 28 statutes, 910 to 950, and known as the International Deep Waterways Commission, to make inquiry and investigate as to the feasibility of constructing a deep-water channel between the Great Lakes and the Atlantic Ocean, in addition to the duties devolving upon and required of them by that act, are hereby directed and required, either by themselves or in conjunction with a similar committee which may be or has been appointed by the government of Great Britain or of the Dominion of Canada, to make an inquiry to Congress as soon as practicable as to what concurrent legislation is required on the part of the United States and of Great Britain or the Dominion of Canada to authorize and permit the erection and maintenance of any dam or dams or other works that may be necessary to regulate the waters of the Great Lakes and maintain them practically at a uniform level, from the head of Lake Superior to the foot of Lake Erie.

SEC. 2. That said committee, either by themselves or in conjunction with said committee of Great Britain or the Dominion of Canada, are further authorized and directed to make an inquiry and an investigation as to whether in their opinion it is practicable to control the waters of the Great Lakes and maintain them at substantially a uniform level at all seasons of the year by a dam or dams or other works placed in the Niagara River at the outlet of Lake Erie, and by a system of wing dams or other structures placed in the Detroit River, and in the St. Clair River, and in the Sault Ste. Marie or St. Mary's River, at or near the respective outlets of Lakes St. Clair, Huron and Superior; and if so, to furnish an estimate of the probable cost of said structures, together with an estimate of the probable length of time required to build the same under any plan submitted, and report the results of such inquiry and investigation to Congress at as early a day as practicable.

SEC. 3. That the sum of $——, or so much thereof as may be required to pay the actual traveling and other necessary expenses of said committee, is hereby appropriated for that purpose.

CLEAN BOILERS.

The importance of keeping the tubes of a boiler clean, not fairly clean, but clean, was brought home to us in a very impressive manner by the review of a test recently made by a well known expert, and which we hope to publish shortly in detail. A horizontal tubular boiler of ordinary size and proportions was given a thorough cleaning inside and out, and then put under test, frequent observations of the coal consumed, water evaporated and up-take temperatures being made. From the beginning to the end of the test, extending over a number of days, there was a progressive increase in the coal required to evaporate a given quantity of water and in the stack temperature. A repetition of the test with a device in service which scraped the tubes while the boiler was in use, showed a maintenance of the initial efficiency, and quite a considerable increase in the average efficiency as compared with the boiler as ordinarily run. Keep your heating surface clean. It is worth while, especially if you have not much of it.—Power.

LOCALLY ANNEALING HARVEYIZED PLATES.

(SEE ILLUSTRATIONS.)

The following is the substance of a paper recently read before a meeting of the American Institute of Electrical Engineers, by Mr. Herman Lemp, Jr.:

One of the latest advances in the making of protective armor for battleships, or even forts, has been the introduction of what is known as the Harvey process. For those not conversant with the latter, I will briefly state that it consists in taking an ordinary low carbon

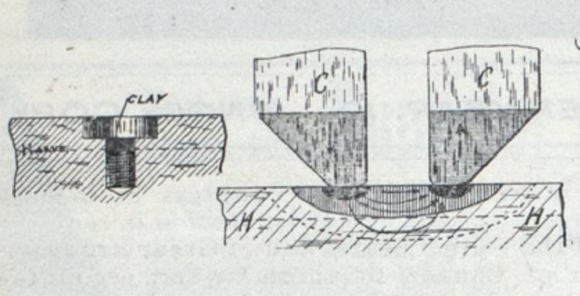


FIG. 1.

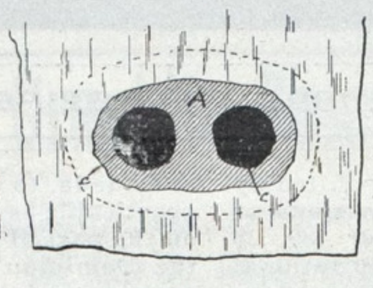


FIG. 2.

FIG. 3.

steel plate and introducing an additional percentage of carbon into the surface metal, thus changing the crust to the depth of about an inch, into a steel resembling tool steel. A plate thus treated is lastly water-hardened, similarly to an ordinary tool, and by experience has shown to offer, under equal conditions, more resistance to the impact of a projectile than any other armor known, and therefore we will take this as an illustration of hard faced armor. The extreme hardness of the surface of a Harvey plate, while exceedingly valuable in preventing projectiles from piercing it, has a disadvantage when it is required to be pierced by a drill and tap.

The methods heretofore used to produce these holes were principally two:

1. To protect the surface of the plates in patches or strips to prevent carburation wherever holes were expected to be drilled.

2. To make accurate drawings and patterns of each plate beforehand, to which all holes are drilled before plate is hardened.

Plan No. 1 was practiced in the United States until it had to be abandoned. In practice it was found that numerous alterations in construction, errors in either draughting-room or mills, made it necessary to pierce holes where no provisions for annealing were made. It also happened quite frequently that the method for prevention of carburation did not always work satisfactorily, and while white paint indicated well enough where soft metal was expected, very often hard metal was actually found.

The second method, which is used in England, has the advantage over the first, that there is no difficulty in carrying it out, provided there are no alterations made, and no errors committed. The present method of construction seems to be, to make, beforehand, a complete model of the vessel to be built; then make accurate drawings and full-size patterns of every plate, giving the exact location of every hole. These are then bored, tapped and countersunk to a depth of approximately ⅝ of an inch and of a much larger diameter, filled with clay, and then the plate as a whole is heated and hardened with water. (See Fig. 1.)

This method works apparently all right, although in spite of drawings and models, errors are made. There is no doubt, however, that it is a slow and very costly method of working, and would hardly ever be resorted to in the United States.

If, by sending a current of large volume through any spot thus to be treated, the spot is brought to a temperature of approximately 1,000° F., there can be no doubt that the temper has been withdrawn. Experiments carried out to that effect at once showed, however, that upon taking off the heating current the heat was so rapidly conducted away by the surrounding metal masses as to cause the heated spot to become chilled just as effectually as if it had been plunged into cold water. No method of outside protection of the heated spot would prevent this, and the gradual cooling of the spot had to be attained by different means; namely, a gradual and slow withdrawing of the heating current. The method of introducing the annealing currents is best shown in Fig. 2.

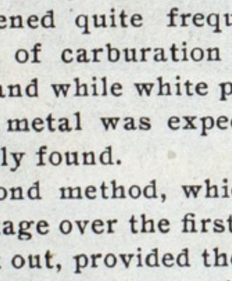


Fig. 8.

C C are two copper contacts cooled by water circulating inside. The current enters the plate by one end, and leaves it by the other. Right under the contact the metal comes to a bright cherry heat, (shown in black) while the portion intervening and partly surrounding the contacts acquires a temperature of just a visible red. Line H H indicates where the influence of the Harvey treatment stops.

The shaded portion in Figs. 2 and 3 shows the zone softened and ready to be machined, while the dotted line shows how far the heat radiation would cause the metal to turn blue. When cooled, the annealed portion shows a chocolate color, while the place where the contacts have been resting is scaled and hard, and can not be touched by a tool to a depth of about ¼ of an inch. These places can again be annealed later on, if required.

The apparatus necessary to carry out this process consists of the generator, the annealer proper (transformer) and the regulating apparatus. The annealer proper is a transformer similar to the well-known welding transformers. As the apparatus is to be operated outdoors, on board of vessels during construction, it is important that the same may be handled with immunity from electric shocks, even when operated in mist and rain. To meet these conditions a copper-clad type of transformer is used, one in which the secondary is composed of two copper castings, each having a rectangular groove, which two halves, when bolted together, form a closed rectangular frame in which the primary is held enclosed. The hollow space intervening between primary and secondary is, moreover, filled with a heavy oil, which acts both as the insulator and conductor of heat from primary to secondary. The secondary, by completely surrounding the primary, affords an excellent mechanical protection, and prevents electric as well magnetic leakage. The primary is a copper ribbon insulated with asbestos, and the ratio of conversion is 100 to 1. The transformer has two trunnions fastened to its sides, in a line a little above the center of gravity, which trunnions swing in bearings, part of a yoke which straddles the whole. The yoke in its turn has a hook which may be secured to the latter at any place of the arch, thus allowing the transformer to be suspended, like a compass in gimbals, in any position desired.

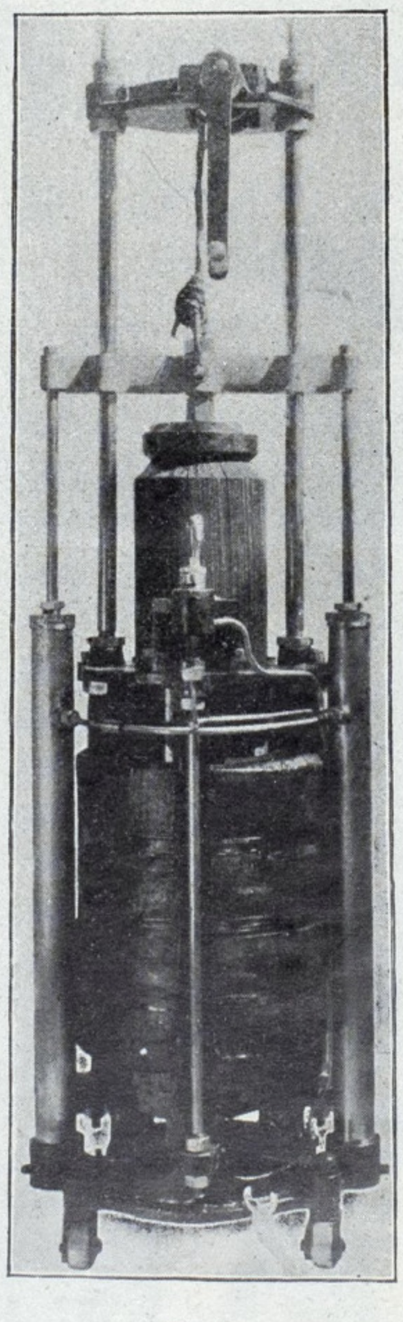


Fig. 4.

It goes without saying that the copper castings, which compose the secondary, are cut through at one place in the circuit. On either side of the cut two short platforms form the base for copper contacts of various shapes and sizes, by means of which the currents are made to enter and leave the plate to be annealed. These copper contacts are of forged copper, hollowed out to receive circulation for cooling purposes, and terminate in narrow tips rounded at the end.

The weight of the whole annealer, being approximately 1,000 pounds, is sufficient to give proper contact pressure for all work on a horizontal plate. When inclined surfaces, vertical or otherwise, are to be worked upon, the transformer is suspended so that its weight shall not interfere with the contact pressure, which is obtained for work by bracing the contacts directly with wooden wedges against any object near by. On the outside of a hull it is proposed to use a pair of electro-magnets, which are made to hold themselves against the iron hull, and form a support for the annealer.

The remarkable thing is the great amount of current that is being carried by the copper contacts into the plate. The contact surface is seldom more than about ½ inch square, and yet 10,000 amperes are made to flow through it continually. This is equivalent to 40,000 amperes per square inch, a density which is only possible on account of the thorough cooling by the water circulation.

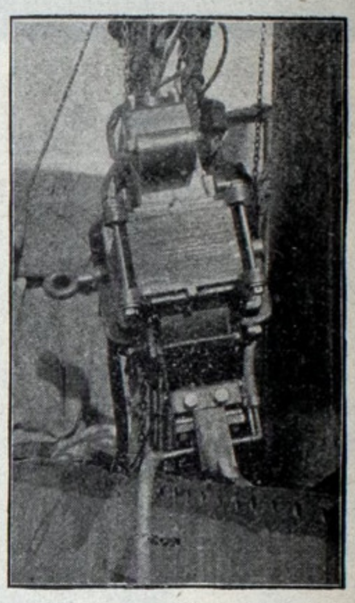


Fig. 5.

The regulating apparatus is, in most cases, simply a rheostat in series with the field of the generator. When more annealers than one are run simultaneously from one generator, as stated before, a reactive coil is interposed between the two (Fig. 4).

The annealing operation is carried out as follows: The transformer is placed in position, the contacts touching the plate either side of the place marked to be annealed, and the primary current brought up by means of a rheostat to from 75 amperes to 90 amperes for about two minutes, according to the size of spot to be annealed, which will bring the metal to a dull red heat, a temperature at which a pine stick catches fire when held in contact with the plate. If no reactive coil is used, the current is now diminished by turning the rheostat one point every minute. If the reactive coil is used, the core is now raised by winch, the coil put in circuit by opening a short-circuiting switch, and then is allowed to descend on its own account. The operation generally takes seven minutes, all told. Accompanying Figs. 5, 6 and 7 show the proper apparatus in operation on the Massachusetts and Oregon. No difficulty has been experienced from the beginning. The annealing of individual spots was, however, only the stepping stone to a more important work of a similar nature, work which was about to be given up, owing to what were considered insurmountable difficulties.

In the construction of a modern man-of-war, there are many armor plates which act as shields to the guns, and have to be perforated to allow the gun muzzle to pass through to be either raised or lowered. Some of these shields are circular or oval, with narrow edges around the ports, in the case of Harveyized plate. To perforate these shields after carburation, and before being water-hardened, was the only possible way, since previous experiments had shown that prevention of carburation could not be relied on, and no process was known to anneal the plate locally after hardening. The hardening of a plate once perforated, showed itself to be, however, almost impossible; in fact, a matter of chance. In most cases the plate cracked in two, as shown in Fig. 8, or the whole plate became distorted in such a way that it could not be used. As individual spots for holes could be annealed, there could be no doubt that a series of annealed spots could be likewise obtained by the electric process, following a line along which a cutting tool was expected to be run. The first attempt, therefore, and made in England, was to anneal a number of spots in proximity to each other in such a way

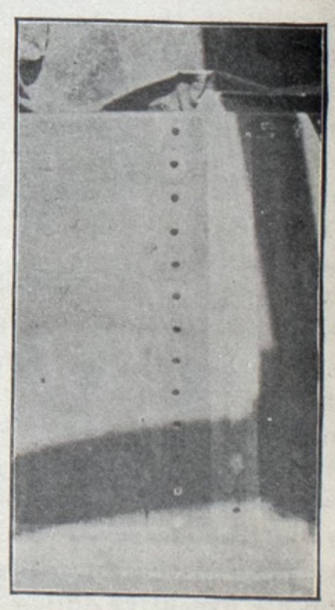


Fig. 6.

that the annealed zones should overlap each other.

As described above, it is very important that the temperature of any individual part should be gradually and slowly withdrawn; and while for individual spots the only possible way to do this was by gradually dim-

FIG. 7.

inishing the current, it was obvious that when a line was to be annealed, instead of annealing a number of spots side by side, the same effect of withdrawing the heat gradually from one portion could be obtained by moving the apparatus itself relatively to the plate to be treated. It was found that a speed of about ¼" per minute was sufficiently slow to ensure thorough annealing.

The copper contacts were of the simplest kind, as described above, bedding themselves partially in the surface, and when being dragged along by the screw and nut, raised in front of themselves a burr or chip similar to a planing tool. After a whole day's continuous use the copper contacts were found in tact, while a number of chips from the steel surface were lying about. We thus had the peculiar phenomenon of a hard steel chip cut with a copper tool.

Upon the completion of the work, it was found that a strip about 2¼" wide throughout the length over which the machine had been moved, could be operated upon by drills or a shaper, in a manner as easily as if it had never been hardened before.

Fig. 7 gives a view of a sample plate annealed by the method described above, and cut out to represent a port-hole as is used on the turrets of a man-of-war.

It is necessary to state that when the apparatus is used for continuous annealing, the primary current is kept at a nearly constant value, the diminishing of heat at any individual spot being obtained solely by the moving of the apparatus from it.

As mentioned before, the places where the contacts are passing over the plate, being brought to a higher temperature than any other, remain hard. Experience has demonstrated, however, that they may be re-annealed later on, by treating the spots in the same way as any other hard spot on the plate. By this means we are therefore able to anneal any shaped portions, not merely lines.

The apparatus may also be used for the reversal of the annealing process; that is to say for creating isolated hard spots in soft tool steel by sending a current through the spot to be hardened until it reaches a bright cherry heat, and then suddenly removing the current or machine.

Various other applications will suggest themselves in the operation of this process, already adopted by the United States government. It may be used in the construction of burglar-proof safes, for dies and punches, for projectiles and other articles of a similar nature.

THE MARINE RECOBD is the repository for all engineering and nautical publications. Hydrographic charts always on hand.

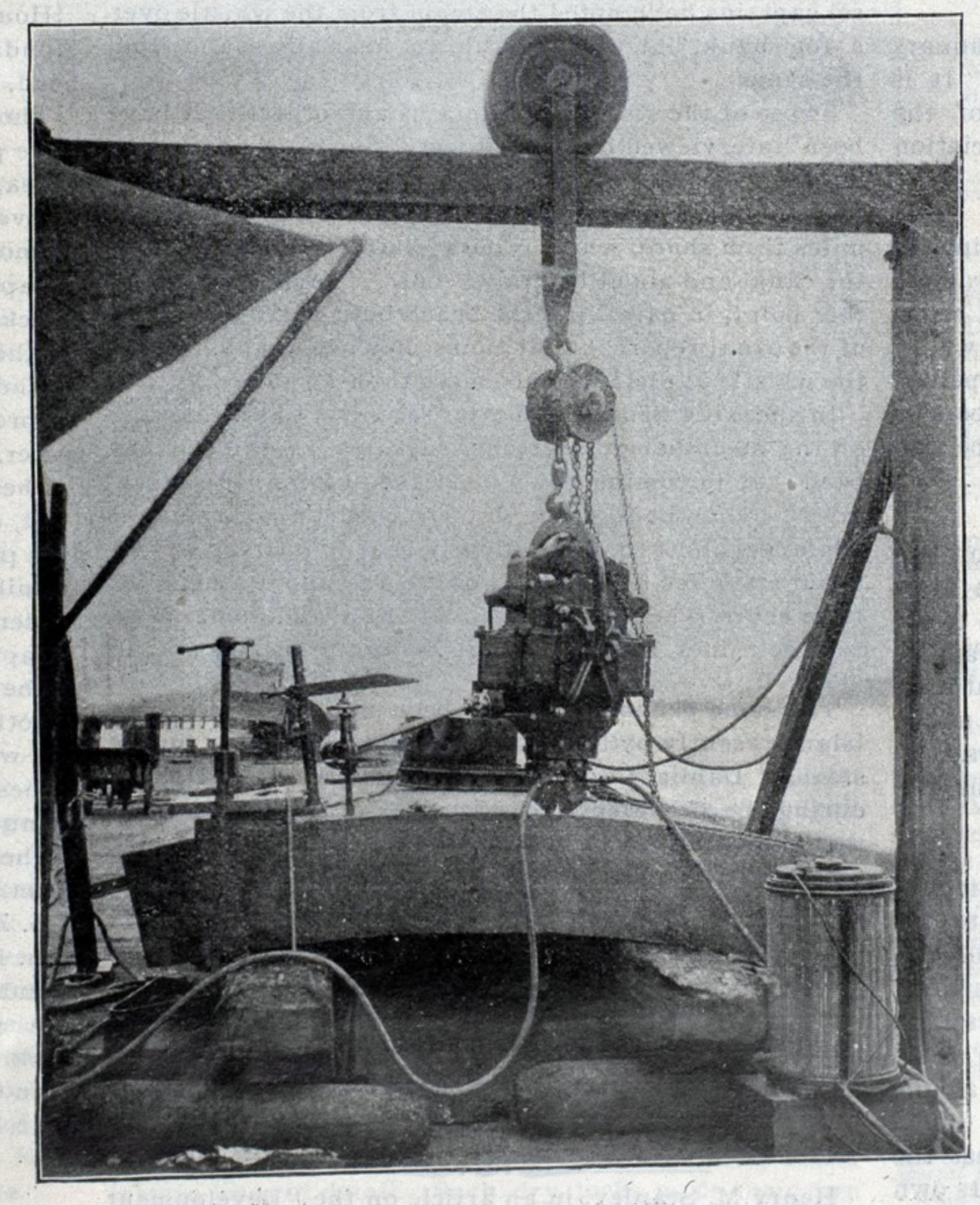
VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD by George F. Stone, Secretary Chicago Board of Trade, January 4, 1896.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY Bushels.
Albany	.....	90,000	215 000	.....	70 000
Baltimore	301.000	1.343 000	158.000	118 000	.....
Boston	1,345 000	282 000	13 000	.....	.....
Buffalo	2,937.000	113,000	31,000	441 000	1 955.000
" afloat	259,000	.....	223,000	.....	304,000
Chicago	21 094 000	1 525 000	554 000	245 000	24 000
" afloat	.....	700,000	227,000	.....	.....
Cincinnati	44,000	5 000	32.000	36 000	135 000
Detroit	357 000	19 000	13.000	14,000	5,000
" afloat	.....	.....	.....	.....	.....
Duluth and Superior	8 877.000	22,000	665 000	154 000	147,000
" " afloat	512 000	.....	.....	.....	.....
Indianapolis	101 000	28 000	.....	.....	.....
Kansas City	1 539 000	5 000	72,000	29 000	.....
Milwaukee	440 000	.....	2,000	179.000	39,000
" afloat	176,000	.....	120 000	.....	.....
Minneapolis	18 842 000	78 000	578,000	156 000	190,000
Montreal	252 000	6,000	190 000	3 000	38,000
New York	7 905 000	1,176 000	1 681 000	23.000	288 000
" afloat	976 000	42,000	314,000	.....	355,000
Oswego	14 000	24 000	.....	.....	146 000
Peoria	61 000	225 000	282 000	.....	.....
Philadelphia	566.000	217 000	172 000	.....	.....
St. Louis	1,420 000	55 000	576 000	11,000	12,000
" afloat	.....	.....	.....	.....	.....
Toledo	867.000	202 000	176,000	123 000	.....
" afloat	.....	.....	.....	.....	.....
Toronto	39,000	.....	58,000	.....	23,000
On Canal	.....	8 000	12.000	.....	.....
On Lakes	.....	.....	.....	.....	.....
On Mississippi	21,000	16,000	5,000	.....	.....
Grand Total	68 945 000	6 181,000	6 369.000	1,532 000	3,731,000
Corresponding date 1894	86,615,000	11 084 000	8,663 000	475 000	2,624 000

NEW GOVERNMENT LIFEBOAT.

The first of 12 lifeboats the government ordered arrived recently in New York from Port Huron, Mich., where they are being built by the Wolverine Dry-Dock Co. It is 34 feet long and 8 feet beam, fitted for oars or sails. It is called the Sandy Hook, and will be stationed at Sandy Hook under Skipper Trexonian Patterson's control. Six of the new boats are for the Atlantic and six for the Pacific coast and the Great Lakes. The



WORKING ON A BIG PLATE.

new boat is self-bailing and she cannot upset. Capt. Thomas D. Walker, inspector in the life-saving service, is enthusiastic over her. "Fill her with water," he says, "and she bails herself out in 15 seconds. She cannot be kept in any position but right side up. Fifty persons can be saved in her at a time. She has a deck, and the space below is divided into airtight compartments. There are air tanks fore and aft reaching above the deck. She will not sink until four-fifths of the air tanks are burst."

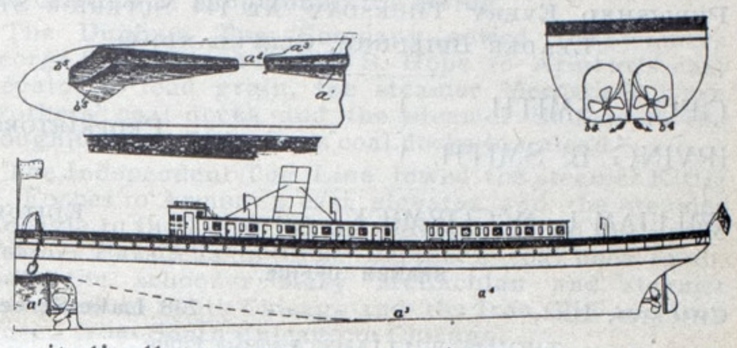
NEW INVENTIONS.

(ILLUSTRATED).

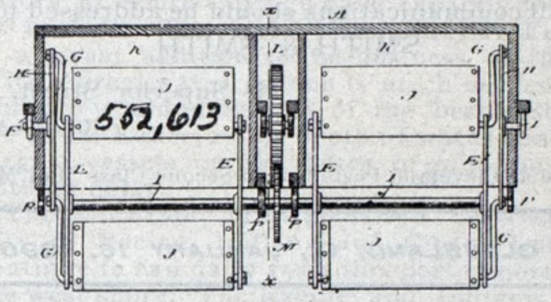
The following patents of interest to the marine and relative industries have been issued within a week:

No. 552,618. Boat. Robert S. Peabody, Philadelphia, Pa. Filed May 1, 1895.

The claim is for a vessel provided with convergent

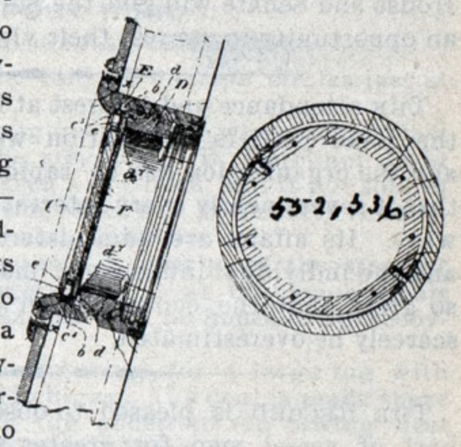


longitudinally convex grooves a', extending from the opposite sides of its prow, and merging with its bottom aft of midships, and extending in the middle of the hull to its stern and having a propeller at the exit of said stern groove and propellers disposed at the entrances of said convergent grooves and rotated in opposite directions in such manner that their lowest portions move inward.



No. 552,613. Marine Propulsion. Andrew Holm, Chicago, Ill. Filed Feb. 28, 1895.

The claim is for marine propellers, a paddle-box pivoted to the stern of a vessel and having two compartments separated by an intermediate space, in combination with a shaft carrying the disks E E and spur-wheel M; two shafts carrying the disks H H; cranks G connecting said disks E—H and provided with wrists pivoted to paddles; and a shaft carrying a spur-wheel L to mesh with the spur-wheel M



the said wheels L M being between the compartments K K.

No. 552,536. Air and Light Port for Marine Vessels. William K. MacKenzie and Charles Chamberlain, Washington, D.C.

The claim is for the combination of a frame or part having a light or ventilating opening, a stopper or closure for the latter composed of a two-part frame, with light lens, and means connecting the stopper or closure and the frame whereby the former can be both rotated and swung upon its bearings, and a locking device for such stopper or closure.

SAGINAW M. E. B. A.

M. E. B. A., No. 92, of Saginaw, E. S., Mich., has elected the following officers for the ensuing year: Past president, Jacob Oscar; president, Charles Morgan; vice-president, Joseph D. Budd; chaplain, John Wychoff; treasurer, John Henry; financial secretary, Walter Henry; corresponding secretary, Harry E. McArthur; recording secretary, Frank Nold; conductor, Joseph R. Hall; doorkeeper, Fred Pflenger; trustees, J. D. Budd, A. M. Barber and M. W. Gaffing. John Henry was chosen as the representative to the national convention, to be held at Washington, D. C. The address of the corresponding secretary is 17 McCormick Building, Saginaw.

MARINE RECORD

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CLEVELAND, O., JANUARY 16, 1896.

MEMBERS of the Lake Carriers' Association have freely signed petitions endorsing harbor improvement projects at Buffalo, Ashtabula, Manitowoc and Ludington.

THE Senate Committee on Commerce has set January 30, for the hearing on the Detroit bridge bill. It is probable, however, that the proper committees of the House and Senate will give the Ship Masters' Association an opportunity to express their views next week.

THE attendance and interest at the annual meeting of the Lake Carriers' association were very encouraging, and the organization has so rapidly extended its scope that it severs nearly every interest on the inland waterways. Its affairs are administered on a broad policy, and the individual influence of many of its members is so great that the concentration of this influence can scarcely be overestimated.

THE RECORD is pleased to observe the desire on the part of vessel men for greater accuracy in the daily newspaper reports of arrivals and clearances, even to the extent of co-operating with the news service management. There is much room for improvement, but little of this is feasible unless the vessel men give some active assistance. This assistance would not require any especial trouble or expense on their part, and the improvement seems likely to be effected.

IT is most proper, from the stupendous showing of vast amounts of freight carried at a great saving to the public, that the government, representing the people as a whole, should expend funds to improve the waterways and avert disaster. At the same time, the statistics from which these striking statements can be compiled come from the reports and clearances made by masters at the custom house. It is certainly remarkable that so much objection should be raised in some quarters against the slight requirements made by the government for its own protection and for securing statistics regarding its coast, wise and foreign commerce. Doubtless the requirement that reports be made to engineers in charge of improvements are burdensome, but this is only temporary. The Great Lakes would probably receive even better treatment at the hands of Congress if each owner would make himself a committee of one to contribute, so far as lies in his power, to the compilation of accurate statistical information. With the single exception of iron ore it is almost impossible to secure figures valuable for comparison because of inaccurate returns made on clearance manifests.

SAND BEACH HARBOR OF REFUGE.

Colonel Lydecker, Corps of Engineers, U. S. A., has made public the annual report of R. M. Wagstaff, custodian of Sand Beach Harbor of Refuge. The number of vessels seeking shelter in 1895 was about 400 short of the largest previous year, although the tonnage was fully up to that of last year. The report by months is as follows:

1895.	STEAM.		SAIL.		TOW.		TOTAL.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
April....	11	4,682.51	3	173.65	2	913.00	16	5,769.16
May.....	43	16,357.63	38	2,458.11	19	10,369.75	100	29,185.49
June.....	26	8,837.70	29	1,618.26	11	3,301.54	66	13,757.50
July.....	79	42,757.35	52	4,185.52	45	22,215.77	176	69,158.64
August....	49	23,918.49	35	3,448.67	18	8,863.06	102	36,230.22
September	92	49,149.83	39	3,208.83	72	36,193.75	203	88,552.41
October....	168	114,791.77	62	8 430.82	114	57,483.78	344	180,706.37
November	101	87,548.59	28	3,034.41	51	26,070.05	180	116 653.05
December.	12	8,488.43	1	340.00	4	1,826.62	17	10,655.05
Total....	581	356 532.30	287	26 898.27	336	167,237.32	1,204	550,667.89

ABERRATION ON LAKE MICHIGAN.

The fog signal located at the lake entrance to the Sturgeon Bay Ship Canal is inaudible and unreliable at certain distances therefrom during the prevalence of a fog, and according to observations made by Chas. O. Chapman, keeper of the station, the area of inaudiblity covers a space of four square miles. Straight out from the canal (SE½E. true) for nearly a mile the fog whistle can be distinctly heard, but beyond that the sound becomes muffled and is suddenly lost to all hearing; this occurs for the space of about a mile, when it becomes audible again. This remarkable phenomenon extends over a space of 2½ miles north of SE½E. (true), and about 1½ miles south of SE½E. (true), and is about a mile in width, and has the same trend as that of the shore abreast of it, which forms an angle of about 90° and from point to point trends north, northeasterly and south, southwesterly.

Many instances are known where steamboat and vessel captains have noted the steam from the whistle over a fog bank, but were unable to hear any sound from the same.

Those of the steamboat captains and others that have been interviewed on the subject differ widely from one another as to the exact location of this obscured spot. Some claim it to be south of the canal and about four miles from shore, while others claim it to be north of the canal and about two miles out. The life-savers at that point, in patrolling the beach both north and south of the canal report that at times they are unable to hear the whistle at distances not more than 2½ miles.

In speaking about the matter recently, Capt. Ed. Cox, of the steambarge Seymour, says his experience has been that in coming down the lake in a fog and steering N. by E. the fog whistle is picked up near and off Ahnapee and can be distinctly heard until at a point about six miles north of Ahnapee and about four miles from shore, when it becomes inaudible and remains so for about four miles, when it is again picked up and held.

The same phenomenon has been noticed at Poverty Island recently by the officers of the light-house supply steamer Dahlia, Capt. Chas. H. Hubbard. The Dahlia, during the prevalence of a fog, passed within a mile of the Island and the officers on board were trying to pick up the fog whistle, but to no avail. Suddenly the fog lifted sufficiently to enable the officers to see the steam from the whistle, but they were unable to hear it until farther on.

Another remarkable instance is the fog whistle at Kewaunee, which can be heard at the canal when it snows as plainly as though it were not more than ten miles distant instead of 25; but in a fog it cannot be heard at the canal at all.

Henry M. Stanley, in an article on the "Development of Africa," which is to appear in the February Century, recalls the fact that troubles with the Boers in southern Africa first induced David Livingstone to travel to the north, and so led the way to the opening of Equatorial Africa. Livingstone, who was a missionary at Kolobeng, accused his Boer neighbors of cruelty to the natives. They resented his interference, and threatened to drive him from the country. He published their misdeeds in the Cape newspapers, and his house was burned in revenge. This led to his leaving southern Africa and going to a region where he could follow in peace his vocation as a missionary, unmolested by the Boer farmers.

FLOTSAM AND JETSAM.

The Straits are now frozen over solid, except the track kept open by the ferry boats.

The car ferry boats St. Marie at the Straits, and the Shenango No. 2, on Lake Erie, were both frozen in for a number of hours this week.

The death of Capt. George W. Vickery is announced from Oswego. He was one of the oldest masters sailing out of that port, and died at the age of 71 years, leaving a number of grandchildren.

The plan of Capt. A. B. Davis of the revenue cutter Johnson, for the patrol of the Sault, includes the transfer of the small boarding vessel Calumet from Chicago.

M. A. Bradley, James Pickands, C. E. Grover, W. A. Collier, and H. H. Brown have organized the Ashtabula Tug Co., and will probably purchase and operate the harbor tugs now in service at that port.

The car ferry Shenango No. 1 has gone out of commission at Conneaut, and all her crew except Capt. McLeod, the mate and chief engineer have been paid off. The No 2 is still in operation. Temporary lull in business is alleged as the cause.

The following directors and officers of the Lorain Steamship Company have been selected: Orville Root, president; E. C. Foster, vice-president; David Wallace, secretary, treasurer and manager; J. H. Hills, Henry Wallace, Thomas Gawn, and J. B. Hoge.

A heavy sea carried overboard five cars loaded with flour and two loaded with dairy products from the Ann Arbor No.1 last week, on the passage from Kewaunee to Frankfort.

The Lake Shore has begun work on the west side of its lake front slip at Ashtabula, clearing up the dock for the construction of twelve new ore hoists, increasing the capacity of Ashtabula 20 per cent.

H. C. Post, B. F. Dwelle and others have sold all the dock property north of Water street, Sandusky, to a syndicate of home capitalists, at the head of which is Jacob Kuebeler, a prominent Sandusky brewer.

Hon. Simon Langell, of St. Clair, fell on the ice on Monday of last week, and sustained some injuries to his head, which, however, are not likely to prove serious.

Thomas R. Harvey and C. T. Gilmore, of the Sault, have purchased Capt. Jesse Bird's steam yacht Wanpoosa, which will act as a reporting boat next year for Harvey's Marine Bureau, and as a delivery boat for Mr. Gilmore's steam laundry.

Capt. Jay Hursley, of the Sault, who bought the wrecked schooners Moonlight and Kent, has placed his brother George and John Ten Eyck in charge of the stranded craft. Sand has been banked against the Kent to protect her from the ice. The boats are free of water.

The owners of the Chapin mine have acquired more land, and the output will be largely increased this year. It is probable that this company will also purchase the Hamilton and Ludington mines, in which the stockholders are already largely interested.

Capt. Jay Harsley of Sault Ste Marie, bought a model of the lost Chicora at the Marquette branch State prison the other day. It was made by a convict out of a pine log, with no tools but an auger and jackknife. It is 30 inches long and 20 inches high, and is fully rigged and manned.

The Sandusky Marine Engineers' Benevolent Association have elected the following officers: President, Geo. Z. Zanger; vice-president, Pat. Ragan; treasurer, Wm. F. Mayer; financial secretary, Carl V. Hart; corresponding secretary, John Erving; conductor, Geo. Moore; chaplain, H. Burkley; inside door keeper, H. Lockhardt; outside door keeper, J. Bankhart; trustees, John Gaa, W. F. Mayer and Geo. Moore; past president, John Hegemer.

ENGINEER CHARTS OF THE SAULT.

There have been a number of inquiries at the RECORD office as to when the new charts of the Sault, under preparation by the engineer corps, U. S. A., would be ready for issue. It is learned from Lieut. Cavanaugh, of Detroit, that the charts will be issued some time during the coming season of navigation. They will be in three sections, but later these three will probably be reduced to one. The first to be issued will cover the river from Gros Cap to the head of Hay Lake, and will include the Little Rapids cut. This chart will probably be issued about the middle of May, and the other two, covering the river down to Detour, later on.

SHIP BUILDING AND REPAIRS.

PROGRESS AT THE YARDS.

E. W. Heath, of Benton Harbor, Mich., has begun work on a fine steam yacht for M. J. Steffens, of Chicago, to be known as the Laura S. She will be 85 feet long over all and 65 feet at the water line, with 14 feet beam. She will be fitted with triple-expansion engines and a Warrington water tube boiler, with 250 pounds working pressure, and is expected to make 15 miles per hour. She will carry a large spread of canvas.

At the yard of the Union Dry Dock Co., Buffalo, W. J. Connors' new yacht is nearly all plated. A good deal of the joiner work is finished in the shop, and the engine and Taylor boiler are well advanced, though not yet ready for delivery. On the new Union liner the largest half of the bottom plating is on and two-thirds of the floors are laid.

The King Iron Works, Buffalo, H. G. Trout, are erecting a triple expansion engine with cylinders 23, 38½ and 64 inches diameter by 42 inches stroke, for the package freight steamer now building at the Union Dry-dock. The boilers for the steamer, four in number, and 11½ feet in diameter by 13 feet in length, are being built by the Lake Erie Boiler Works, of the same city.

Work at the Chicago Ship Building Co.'s yard has been somewhat delayed by a strike of the riveters The first schooners ordered by the Minnesota Steamship Co. and that for the Northwestern Transportation Co. are well closed in, all the shell and water bottom plating being practically concluded, and most of the inside plating done. About a month's work on each would fit them for launching. The Elphicke-Drake steamer has her water bottom almost completed. She is building for a Bureau Veritas classification. The mills are very backward with material for other ships at this yard, and they make little showing in the yard.

GENERAL REPAIR WORK.

The steamship S S. Curry is in the large basin of the Ship Owners' dry-dock. The repair job on her is very heavy, about 32 plates having to come off. The Wallula is still in the south basin.

The German and Cambria were in the Cleveland dry-dock this week. The German had work done on two plates. One bottom plate on the Cambria is receiving some work and new fender strakes are being put on.

BUFFALO.—While repair work is not quite so heavy as a year ago, dockages are more frequent, the jobs being on a larger number of boats. The iron steamer Arabia had some of her plates repaired in the Mills dry-dock, and is now at the yard of the Western Transit Co., herowners, who are putting in a new upper body, including frames, decks, deck beams, stanchions, and rail. Other boats which have been in the Mill's dock during the past few weeks are the Pathfinder, for replacing damaged bottom plates, the John Oades, for new frames, keel, forefoot, and bottom planking; Roumania, for general repairs; the George F. Williams, repairs to bottom damage on three different occasions, and cutting by ice, considerabie calking being needed; the H. E. Packer and R. A. Packer for bottom repairs; the Tacoma for a two weeks' job of bottom planking; the Fred Mercur, for extensive bottom repairs; and the Juniata, for repairs to arches, arch posts, bottom and keel. The Livingston, which received only temporary repairs at Detroit, will go into this dock soon for permanent work. The Queen of the West is having her old machinery taken out at the Mills dock and will have some new bottom planking done.

Whitman & Co., will put the engines of the old Calumet into the Queen of the West, also the boiler that was taken out of the lost steamer Newburg. New bedplates for the engine are also being put in.

Whaleback barges 115 and 129 have been receiviug some repairs to top-side plates at the Mills dry-dock.

At the Union dry-dock a large job on the Owego was completed last Friday. She had 25 damaged plates, six being too badly injured to be replaced. The Russia will be out this week. By reason of her collision with the Britannic last season, it was necessary to strip both her bows and rebuild them. She also had some bottom calking done. The John W. Moore is now receiving some bottom repairs.

CHICAGO.—At Miller Brothers' shipyard the steamer J. E. Owen went out of dry dock Saturday and the steamer Pascal P. Pratt went in on Monday to receive some new bottom planking and calking, repairs to her wheel and stern bearing, new boiler house coamings and some general repairs. The schooner J. J. Barlum is receiving a piece of new stem and some general repairs. The steamers Tasmania and Syracuse are receiving some repairs.

DRY-DOCK ASSOCIATION OF THE LAKES.

(SEE ILLUSTRATION).

The annual meeting of the Dry-dock Association of the Great Lakes was held with a full attendance in the parlors of the Russell House, Detroit, Thursday morning. Manager Edward Gaskin, of the Union Dry-dock, Buffalo, was chosen president. W. I. Babcock, of the South Chicago Dry-dock, vice-president; H. J. Mills, of the Mills Dry-dock. Buffalo, secretary and treasnrer. Resolutions of rerpect and regret were adopted ia connection with the death of Mr. J. C. Parker, of Detroit, vice-president ef the Association.

Last year's card of rates was adopted for the coming year, save that lay days will be charged a vessel beginning twenty-four hours after she is docked, regardless of the number of men employed on her. The 10 cent per ton charge for cargo ln docking laden vessels was also restored to the card.

PRESIDENT EDWARD GASKIN.

IN THE INTEREST OF UNIFORMITY.

An informal conference of metal ship builders on the lakes was held at the Russell House, Detroit, Thursday. Matters of general interest to the trade were discussed, with the object of securing a more uniform policy along certain lines of detail. Such dry-docks as do their own metal repair work were also represented at the meeting.

TEH NEW HYDROGRAPHIC OFFICE CHARTS

Are meeting with great favor among vessel masters. One of the charts covers Lake Huron, Georgian Bay, and the Straits of Mackinaw, all on a single sheet. Lakes Michigan and Superior appear on single sheets. A chart of Lakes Erie and Ontario, also one of St. Joseph's channel with St. Mary's River from East Neebish to Mud Lake have been issued. The Hydrographic Office does not engage in the sale of any of its publications. All charts, sailing directions, etc., can be procured from THE MARINE RECORD, 144 Superior street, Cleveland.

NEWS AROUND THE LAKES.

CHICAGO.

Special Correspondence to The Marine Record.

Capt. John Prindiville chartered the steamer Niko for corn at 4½ cents, free of canal tolls, for winter storage and delivery at Kingston in the spring.

The Dunham Tug Company towed the steamers George Spencer and George S. Hope to Armour's east elevator to load grain, the steamer Mecosta to Coxe Brothers' coal docks and the steamer Sauber to the Youghiogheny Company's coal docks to unload.

The Independent Tug Line towed the steamer Kittie M. Forbes to Armour's east elevator and the steamer Moravia to the Dolly Varden elevator to load grain, the steamer Pasadena to Coxe Brother's coal dock to unload, the schooner Mary McLachlan and steamer Josephine to South Chicago and the Iron Cliff and Iron Queen from South Chicago to Chicago.

Capts. E. M. Peck and L. C. Waldo, of Detroit, were in Chicago on Tuesday. They paid a visit to the Chicago Ship Building Co.'s shipyard at South Chicago.

The freight rates on grain continue at 2⅝c on corn, with supply and demand about equal.

At South Chicago there is a fleet of 70 vessels in winter quarters. The Lehigh Valley Company are erecting a new elevator, which will have capacity for 800,000 bushels of grain. They are also building a new coal dock. The Reading Company have just completed a large new coal dock. The grain elevators at South Chicago have capacity for 6,000,000 bushels. The Lake Michigan Car Ferry Co. is a great addition to the business of this port. With a breakwater, which is much needed, South Chicago would make one of the best harbors on the Great Lakes, as the depth of water enables the largest vessels on the lakes to go to their docks without delay.

The Goodrich Transportation Co.'s steamers City of Racine, Indiana and City of Ludington continue to run daily from this port to ports along the west shore. The Racine and Indiana runing as far as Manitowoc, and the City of Ludington as far north as Green Bay. They have experienced but slight inconvenience from ice so far this season.

The officers of Chicago, Lodge 3, of the Shipmasters' Association, were installed by Grand Master C. E. Benham at a meeting held at their hall last Wednesday afternoon. WILLIAMS.

PORT HURON.

Special Correspondence to the Marine Record.

Things are very dull in marine circles just at present.

The barge Montgomery that was wrecked last fall in tow of the steamer J. B. Ketchum is at Dunford & Alversen's dry-dock and if not sold in her present condition she will be entirely rebuilt and put in first class condition.

Capt. John Symes, formerly of the steamer Cadillac, is dangerously ill at the home of his father-in-law at Sarnia with no hopes of his recovery.

Parties here are figuring for a large tug with parties on Lake Michigan. If a deal is made there will be one more tug added to the towing fleet on St. Clair and Detroit River.

The river is filled up with ice as far up as the head of Mills Island (formerly Stag Island). The steamer Mary is laid up here.

The machine shop on the river bank known as the Dry-dock Iron Works, about which there has been so much litigation, is to be heard in the circuit court the latter part of the week. The case is McMorran vs. Fitzgerald Bros., and the plaintiff sets forth that Fitzgerald Bros., notwithstanding the decree and order of the court still continue to conduct and carry on the business of the Dry-dock Iron Works on the bank of St. Clair River opposite the plaintiff's residence. He asks that they be arrested for contempt of the court's order and held in custody until the buildings shall have been removed.

Capt. Chris. Smith, of the steamer L. R. Doty, has sold his five-acre farm in Kimball township to George Pike, for $200. KENDALL.

MANISTEE.

Special Correspondence to The Marine Record.

The boats in winter quarters here are the steamers Edward Buckley, Mark B. Covell, Robert C. Wente, Ida E. Maggie Marshall, Charles Reitz, Islander, Minnie M., and Ossifrage. and schooners Isabella Sands, A. W. Luckey, Arendal and Green.

In an article in your paper of Jan. 2d, I noticed the destruction by fire of the Graham & Morton steamer Puritan. The Puritan did not belong to Graham & Morton, of Benton Harbor, but belonged to the old Seymour Transportation company, of Manistee, of which the chief stockholders reside here. O. S. O.

THE MARINE RECOBD is the repository for all engineering and nautical publications. Hydrographic charts always on hand.

CORRESPONDENCE.

☞We do not hold ourselves responsible in any way for the views or opinions expressed by our correspondents. It is our desire that all sides of any question affecting the interests or welfare of the lake marine should be fairly represented in THE MARINE RECORD.

LET THE GOOD WORK GO ON.

To the Editor of The Marine Record:

While working for a 20-foot channel on the lakes nothing has been done to deepen the harbors. Now is the time for Buffalo to wake up and use her political pull to "get there" without one cent of cost to the city. Our citizens appear to be waking up to the sensible idea that the true way to obtain deep water is to stop the outflow by damming Niagara River. If said dam is placed in the neighborhood of Tonawanda, the entire river bank from there to Lake Erie would be lined with docks and ware houses and would be one of the grandest harbors, not only on the lakes, but in the world.

Some people will say, "Oh, that won't do; look at the amount of damages we will have to pay for flooding private property!" But they are mistaken; the banks of the river are high and bold nearly the entire distance, and the price of property will more than double the day when work begins on said dam. Of course the consent or co-operation of Canada would have to be obtained; but that would be easily arranged, as they would have all to gain and nothing to lose. If the water was raised three or four feet above the present Lake Erie level, say, at the International bridge, it would not damage one foot of property on the Canada side. The only property I know of that could be flooded by placing the dam just above Tonawanda, is the low portion of Black Rock, just below said railroad bridge; but the government or private individuals can make millions by buying up all the real estate on both sides of said river, then getting the consent of both governments and building said dam.

This is a big scheme, and some may say that it is a wild one; but it is a money maker. Let me know when you organize a company and I will drop the first nickel in the slot, and feel sure it will roll out on the other side a full fledged dollar.

I am pleased to read your article on the ship "Great Eastern." I heard quite a heated argument about her a short time ago, and, as usual, both parties were off.

We are in receipt of a handsome calendar, with life-saving scene in steel, from John S. Parsons, successor to Daniel Lyons & Son, in the shipchandlery and sail loft business, corner W. Cayuga and Water streets, Oswego. The American Injector Co., of Detroit, have also issued a natty calendar, illustrating the "good suction" properties of their product.

A FAMOUS FURNACE.

The Morison Suspension Furnaces for stationary boilers have attained a wide and well deserved popularity in all that appertains to economy, safety and durability. There is no doubt that the principle of an internal furnace tubular boiler is the correct one and that this type has certain advantages over others, particularly where considerable power is required and only a limited amount of space is available for boiler room. This suspension furnace is very compact in form. It consists of a horizontal cylindrical shell having an internal furnace flue in one end of which the fire grate is located, the other end terminating in a fire brick lined back connection, or combustion chamber, which is contained in a casing, forming an extension to the shell proper. The products of combustion are conducted therefrom through horizontal tubes and delivered into the sheet iron breeching attached to the front head of the boiler. This breeching may be connected directly with smoke stack. This boiler may be also arranged to contain two or more furnaces, or it may be provided with comparatively short furnaces terminating in a combustion chamber from which the tubes lead direct to a smoke connection at the rear of the boiler, without returning forward over the furnace. Boilers of this latter type have, in numerous instances, been employed in the U. S. Navy with highly satisfactory results. The corrugation of the furnace surface serves to retard the passage of the gases, thus producing more perfect combustion than is generally attained. This in connection with the increased amount of heating surface in the most active portion of the boiler, gained by this conformation, cannot prove otherwise than convincing in respect of the claim of economy for this furnace. The Continental Iron Works (Greenpoint), Brooklyn, N. Y., are the manufacturers of the Morison Suspension Furnace, also protector fire fronts and doors, welded steel shells and drums and special forgings.

VALUE OF TRUTH.

NOWHERE GREATER THAN IN THE WORDING OF AN ADVERTISEMENT.

The most casual reader of advertisements (and most people do read them in this age of knowledge-seeking and knowledge seekers) cannot help being struck with the seeming exaggerations in statements that are so universally used to command attention. With new seekers after public approval for an article offered for sale or, rather in advertising a new article or invention for sale, its promoters have to create a reputation for it, or their own reputation must stand sponsor for it before the aggressive or seemingly exaggerated style of advertising can be successfully adopted. But if one sticks to the truth, the whole truth and nothing but the truth, the article so advertised, provided it has intrinsic merit, cannot fail to win. With the winning of a crown of success comes the right to tell the big, big truths which look so much like exaggerations.

For example, when in the Keasby & Mattison Co.'s advertisement you read that magnesia sectional covering is "absolutely fire-proof" and a "great coal saver," it is true.

When the Upson Walton Co., of Cleveland, advertise "best steel tow lines," it is true.

When the Garlock Packing Co. say of their packing: "We guarantee every ounce of it," it is true.

When Ed Wertheim, of Chicago, says he is headquarters for the celebrated "German Asbestos Goods," it is true.

And when you see stated in an advertisement of Beeson's Inland Marine Directory for 1896, on Page 12, of this paper, that "it is ordered by and in use in all the offices of the United States government having to do with vessel interests," it is true. And it don't mean in a few, as this order for one branch of the government service will show:

Order No. 708.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.
WASHINGTON, D. C., Jan. 2, 1896.

Please deliver at the Weather Bureau, 24th and M streets, N. W., ten copies of Beeson's Inland Marine Directory for 1896, as per price quoted in your letter of Dec. 19, 1895, for issue to stations. A. ZAPPONE,
Assistant Chief of Division of Accounts.

Consider well the weight of truth in advertising. It has always paid me, and it will you, Mr. Advertiser.

Yours sincerely, HARVEY C. BEESON.

ELECTRICALLY DRIVEN OCEAN STEAMERS.

By those conversant with the problem attending the propulsion of large steam vessels, it will be conceded that the limits of practical speed have with the present apparatus been pretty well reached. At the present time most of our large passenger vessels work certainly at uneconomically high rates, and probably at speeds on which but little improvement is, from an engineering standpoint, possible. The difficulty with the bearings in high seas when the propellers are apt to race, is not a trifling matter, but in addition to this consideration, speeds have a very detrimental effect upon the structure of the ship, involving either unnecessarily heavy construction, or shaking of the vessel to pieces. An American inventor, who advocates the use of electricity for propulsion of ocean going steamers, is about to equip a steamboat on the following lines: He will put in his boat a powerful engine of the slow-speed type, connected to a multipolar generator transmitting current to electric motors attached directly to the propeller shafts. The motion of the motors being rotary, a very high speed could be attained with comparatively little vibration, while the reciprocating part of the propelling machine—the engine—could be run at a comparatively slow speed. The further advantage of better regulation in rough weather, when the propellers lift, would be secured.—Electrical Plant.

A TIDE OF OPPORTUNITY.

It is highly improbable that the United States will be engaged this year in any war. But the air is filled with war talk and all the nations of Europe seemed so determined to get a whack at England, for one reason or another, that some of them may before the year is out be gratified with a fight, whether, however, with satisfactory results to themselves is by no means certain. The situation is wholly in favor of the United States. In any case they cannot but reap advantage from it. Their policy is to push forward their foreign trade. Their best opportunity has now come. American goods for all the disputants should be their policy. There is an immense amount of bluff going on, but the American has now his chance to push his interests in the world.—New York Maritime Register.

TACOMA'S COMMERCE FOR 1895.

Harbor Master Clift makes the following report of the ocean commerce at the port of Tacoma for the year 1895:

IMPORTS.

Twenty-three cargoes Oriental mdse, total	$17,711,630.84

EXPORTS.

3,385,292 bushels wheat	$1,507,953.15
295,938 barrels flour	708,007.80
94,056,689 feet lumber	870,201.33
519,105 tons coal	973,928.00
Merchandise to Japan and China, exclusive of flour	441,573.77
Merchandise to British Columbia	131,725.73
Total	$4,633,389.78

Inward registered tonnage, 601,707; outward registered tonnage, 551,506; inward cargo tonnage, 102,516; outward cargo tonnage, 652,187; deep sea arrivals, 417.

TRADE NOTES.

The Roberts Safety Water Tube Boiler Co., announce that they will be glad to supply any engineer with one of the artistic calendars which we mentioned last week.

The Penberthy Injector Co., of Detroit, issues a very handsome calendar, the work of this company's own advertising department. It shows excellent taste, and gives a good idea to the trade, by illustrations, of the various types of the Penberthy injector.

The Lake Michigan Car Transportation Co. have written another very complimentary letter on the Shaw & Spiegle steam towing machines to the American Ship Windless Co., Providence, R. I., manufacturers of this machine. A very fine Christmas and Industrial number of the Providence Telegram prints an illustrated description and history of the American Ship, Windlass Co.

Four of the largest steamers building at F. W. Wheeler & Co.'s yard, West Bay City, will be equipped with the usual extensive electric plants by the General Electric Co. These are the Roby, Eddy, Whitney, and Mitchell boats. The revenue cutter John G. Carlisle, building at the Globe yard, and three steel schooners under construction at the yard of the Chicago Ship Building Co., will also be equipped by the General Electric Co.

The Link Belt Machinery Co., Chicago, are still running their works day and night, using the largest force ever employed by them. Recent contracts for electrical coal mining machinery have been closed with the following companies: Norfolk Coal & Coke Co., Norfolk, Va., consisting of two 66-inch x 18-foot boilers, one 14x16 McEwen engine, one 7-foot chain breast machine one enclosed electric grinder, circuits, etc.; Reed City Coal & Mining Co., Reed City, Ill., one 15x16 McEwen engine, one emery grinder, one 100 kw. dynamo, switchboard, circuits, and four 6-foot chain breast machines; Osage Coal & Mining Co., Krebs, Ind. Ter., one 6-foot chain breast machine.

ENGINEER-IN-CHIEF MELVILLE has proposed to the Navy Department that he be permitted to lengthen the propeller shafts on the ram Katahdin. By this means he believes that he can safely make the vessel reach a speed of 17 knots with a cost of only $5,000 at the utmost. The department is considering the proposition. The President has signed the bill directing the Secretary of the Navy to accept the ram and Gen. Hyde, the president of the Bath Iron Works, is being heartily congratulated upon the acceptance of the ship.

LAKE CARRIERS' ASSOCIATION.

FIFTH ANNUAL MEETING OF THE CONSOLIDATED ORGANIZATION.

THE MOST PROSPEROUS YEAR IN THE HISTORY OF THE ASSOCIATION—SHIPPING OFFICES—GRAIN SHOVELING AND FUELING REFORMS—PROCEEDINGS IN DETAIL.

At 10:40 a. m. Wednesday, President Wm. Livingstone called the annual meeting of the Lake Carriers' Association to order, in the Conservatory of Music, stating that the hall had been selected in order that the association might go into executive session when necessary. He then made a short speech of welcome, saying that the closing year had shown the largest tonnage membership in the history of the association. He invited a full and free discussion of the Detroit River bridge and other important questions. He referred in a touching manner to the death of Gen. O. M. Poe, and said there was no one present but was fully aware of his untiring efforts and his unswerving loyalty to lake commerce. It seemed to him fitting that the association should take some action before adjournment toward placing some sort of a memorial showing appreciation and gratitude.

Mr. Goulder then moved that action relative to the death of Gen. Poe be made a special order of business for 10 o'clock Thursday morning, when Gen. Alger would probably address the association. Secretary Keep then read his annual report.

ANNUAL REPORT OF THE BOARD OF MANAGERS.

TONNAGE OF THE ASSOCIATION.

The membership of the association shows a very gratifying increase during the year which is just closing. For the year ending March 31, 1895, the tonnage of the association was 590,136 tons For the current year the tonnage is 617,880 tons This is an increase of nearly 30.000 tons, and the figures for the present year are the largest in the history of the association. Outside of the railroad ferry lines and passenger lines which operate in certain localities where they do not share to any great extent in the benefits afforded by membership in the association, there are not 20 important vessels on the Great Lakes which are not now on our rolls. The Board of Managers is much gratified at this showing and feels that it affords a conclusive proof that the association is accomplishing valuable results.

FINANCES OF THE ASSOCIATION.

The annual dues for the current year remain at three cents per net registered ton, to which figure they were reduced at the annual meeting in 1894. The treasurer's report, which is submitted herewith, shows that these dues have been well paid up, but that the income of the association has not been quite sufficient to meet all expenses. It is not necessary to review the treasurer's report in detail. It is enough to say that the uncollected dues which his statement shows as $462.99 have been reduced by later payments to a little over $200, most of which will probably be collected, and that there is now a balance of about $850 in the treasury which will nearly provide for existing liabilities. Every year heretofore the treasurer has been compelled to borrow money at some time between the annual meeting and the first of May to meet the expenses incurred during the winter and before the new dues were paid in. We had hoped that this year we should not be compelled to do this, but the statement submitted shows that a small sum will have to be borrowed to tide over the interval until the income of the coming year is available. In 1894 the expenses of the association were quite rigorously cut and decided economies have been in force ever since. The current year has also, like the previous year, been comparatively free from extraordinary and unforseen expenses. The very low stage of water, however, compelled the association to establish some additional lights in the vicinity of Ballard's Reef and at other points in the Detroit river, and these increased the expense of private lighting beyond the estimates. Aside from this, all expenses have been kept down to the lowest estimated requirements.

OPERATIONS OF THE SHIPPING OFFICES.

Shipping offices of the association have been maintained during the past year at Cleveland, Chicago, South Chicago, Buffalo, Ashtabula and Toledo. The following condensed report taken from the annual report of Chief Shipping Master Rumsey shows the number of men placed on board vessels at each of these points as follows. There have been no complaints from members of unsatisfactory service at any of the shipping offices:

Put on board at Cleveland	2,871
Sent from Cleveland to other ports	530
Put on board at Chicago	2.861
Sent from Chicago to other ports	112
Put on board at South Chicago	2,494
Put on board at Buffalo and Tonawanda	2,300
Put on board at Ashtabula	1,892
Sent from Ashtabula to other ports	160
Put on board at Toledo	755
Total	13,975

The total number of men shipped during the past season shows an increase of 3,919 over the season of 1894. This is an increase of 40 per cent and shows that the use of the shipping offices by members is growing very rapidly. The greatest increases in 1895 have been at South Chicago and Buffalo.

THE FUELING AGREEMENT.

In reviewing the operations of the past year the first place should, perhaps, be given to the important work projected at the last annual meeting in reforming the practices prevailing at the port of Buffalo in supplying steamers with fuel. At last year's meeting the committee on fueling presented a report which was adopted by the meeting, in which they recommended that vessel owners on the lakes, whose vessels carried coal cargoes out of Buffalo, should sign an agreement pledging themselves each to the other that under no circumstances would they purchase fuel for their steamers directly or indirectly from any shipper of hard coal. Such an agreement was prepared and largely signed by those present at the last annual meeting. After the meeting the committee on fueling circulated the contract among vessel owners generally and succeeded in securing the signature of so large a proportion of the tonnage which is engaged in carrying hard coal out of Buffalo that the plan was declared operative, and all signers of the agreement were notified that the necessary tonnage had been secured and that they were expected to live up to the contract in all particulars It was not expected that a victory could be won in this matter without a long and hard fight. The shippers of hard coal and their agents, who had exacted as a condition of chartering a vessel to carry hard coal that they or some person designated by them should have the privilege of fueling the vessel at a price 40 or 50 cents above the price at which soft coal firms stood ready to furnish the same or better fuel, would not willingly see a practice, so decidedly for their advantage, go out of existence. Circumstances, however, were on the whole favorable to the vessel owners. During the early part of the season the movement of grain to Buffalo was light, so that a comparatively small number of vessels outside the line boats visited that port. There was, therefore, no great competition to secure charters for carrying coal. Later in the year when the grain trade became active, and the number of vessels desiring coal charters became numerous, the requirements of the coal shippers became large and pressing, and the amount of coal to be forwarded was unusually great. In addition to these favoring circumstances, the vessel owners had the very great advantage afforded to them by the skill, care and constant vigilance exercised in their behalf by Mr. J. J. H. Brown, the Buffalo member of the fueling committee. Capt. Brown was in a position to know exactly what was going on in the matter of chartering for coal He kept the closest watch of every phase of the struggle between the vessel owners and the coal shippers and was always on the alert to detect the slightest sign of weakness on the part of the vessel, and to keep vessel owners promptly advised of every occurence, however slight, which had any bearing on the controversy. The amount of time, patience and skill which he gave to the matter can scarcely be over estimated, and the Board of Managers desires to express in its annual report the great obligations of all vessel owners to him for the generalship which he showed in conducting this struggle on their behalf. The result of this combination of favorable circumstances and skilful leadership was a complete victory on the part of the vessel owners During all the latter part of the season vessels were freely chartered for coal without the slightest pressure put upon them to buy their fuel at any particular place On the contrary, the vessels fueled where they chose, and at a price far below that prevailing in previous seasons. Good ¾ lump coal was placed in the bunkers of steamers at from $2 10 to $2.20 per ton, as against a price of $2.60 per ton in 1894 for fuel which has been described as "anything that was black." It is estimated that the money saving to vessel owners during the season of 1895 in the price of fuel at Buffalo was over $50,000; and it is believed that the exactions which prevailed in the season of 1894 and preceding years have been permanently ended.

THE POLICY FOR NEXT YEAR.

During the latter part of the past season the hard coal shippers freely offered fuel to vessels at the same price at which it was furnished by the soft coal dealers. Under the agreement which vessel owners had signed, however, vessels were not free to fuel with the shipper even on the same terms at which fuel was offered by the regular fueling docks. An important question to come before the annual meeting this year will be to determine the course to be followed during the season of 1896. Two possible courses lie open First, to enter into a new agreement similar to that of last year, whereby vessels bind themselves not to take fuel from any shipper of hard coal. Second, to raise, what has been called by the hard coal shippers the "boycott" upon them, upon the distinct understanding that vessels shall be free to fuel with the hard coal shipper or with the soft coal firm, as they choose, and that under no circumstances shall the hard coal shipper exact a price for fuel over and above that at which the soft coal firms are ready to furnish it, it being also understood that as soon as there is any indication that the charter of any vessel for hard coal is in any way dependent or conditioned upon her fueling, the agreement of last year shall be revived and all fueling with shippers or their agents shall cease.

GRAIN SHOVELING AT BUFFALO.

In 1893 the scale of charges for shoveling grain at the port of Buffalo was as follows:—

For steamers:

For grain in the hold,	$ 4 00 per 1000 bush.
For grain between decks,	4.50 " " "
For wet or damaged grain,	10 00 " " "

For sailing vessels, $3.50 per 1000 bushels for grain in good condition, and $10.00 per 1000 for wet and damaged grain.

A reduction in these charges was obtained so that in 1894 the rate for shoveling grain in the hold of steamers was reduced from $4 00 per 1000 to $3.75, the other prices remaining as before. The matter of a further reduction of the grain shoveling charges at the port of Buffalo was brought up at the last annual meeting and a committee, of which Capt. J. J Brown, of Buffalo, was chairman, was appointed to see what could be done in the matter. Under the guidance of its chairman this committee adopted and put into operation a plan for shoveling grain at Buffalo which is entirely new and which has proved itself during the season of navigation just closed a complete success.

Before the opening of navigation a contract was entered into between the Lake Carriers' Association and James Kennedy of Buffalo, N. Y, whereby Mr. Kennedy contracted and agreed to do all the shoveling of grain out of vessels of the association during the season of 1895 at the uniform rate of $3.50 per 1000 bushels, irrespective of the kind and condition of the grain and of its situation in the vessel, and with no distinction between steam and sail vessels. In order to show just what has been saved to vessels under the operation of this contract a statement has been obtained from Mr. Kennedy showing his operations under the contract during the past year. A summary of this statement is as follows: During the past season there was shoveled at the port of Buffalo 121,225,497 bushels of grain Of this, 103,225,497 bushels was grain in good condition carried in the hold of vessels. 15,000,000 bushels was grain in good condition carried on deck, and 3,000,000 bushels was wet or damaged grain On the grain in good condition, carried in the hold, the charge for shoveling was $3.50 per 1000 as against $3.75 per 1000 in 1894 and $4.00 per 1000 in 1893. Calculating the saving only for the difference between 1894 and 1895, namely, 25 cents per 1000, the shoveling charges on this grain were reduced under the operations of Mr. Kennedy's contract $25,806.00. On the grain carried on deck there was a saving of $1.00 per 1000, or $15,000.00 in all, and on the wet and damaged grain there was a saving of $6 50 per 1000, or $19,500.00 in all, making a total saving to vessels of $60,306.00. This, however, is far from showing the real advantage to vessels derived from this contract. It is conceded that the work of shoveling grain in vessels has never been so satisfactorily performed as during the past season. In former years it was the practice to stop work precisely at midnight on Saturday night, even if only a small remnant of grain was left in the vessel. In such cases the process of unloading was finished on the following Monday. During the season just closed it has been the uniform practice to finish unloading all vessels where the process was once begun. This has resulted in a large saving of time to many vessels during the season. In addition to this, the contract system of shoveling grain has done away with a number of practices which had grown up in the business which tended to send vessels having cargoes consisting of several different lots of grain to as many different elevators. Under the present system much less shifting of vessels during the process of unloading is necessary, and valuable time, as well as tow bills, has been saved.

EXTRA PRIVATE LIGHTING AND MARKING OF CHANNELS.

Besides maintaining the usual number of private lights on the Canadian side of the Detroit river, the association was compelled during the season just closed, by the extraordinary low stage of the water and the consequent groundings and difficulties experienced by vessels at new points in the Detroit river, to expend about $900.00 extra for additional stakes, buoys and lights. These additional marks were placed under the direction of Capt. George P. McKay, the efficient chairman of the Committee on Aids to Navigation The result of establishing them was a large decrease in the number of accidents in their locality and afforded positive proof that exactly the right thing had been done. On August 20th, 1895, Capt. McKay superintended the placing of the following marks: A black stake on Briton shoal; a float light on the foot of Bois Blanc Island; a float light on Boston shoal; a float light on New York shoal; a float light and black stake directly opposite Amherstburg, Ont. On the 21st of October, 1895, Capt. McKay placed six float lights and six black stakes and one red stake between Limekiln Crossing and Ballard's Reef. On the night of October 20th, just previous to Capt. McKay's arrival at this point the steamer Waldo Avery had struck there and was leaking badly The steamer John Craig was sunk, and several others had experienced trouble. Capt McKay was obliged to act promptly in the matter to avoid further disasters, and the stakes and lights above referred to were ordered placed by him on his own authority. This result was as beneficial to the underwriters as to the vessel owners, and the underwriters will be asked to share the extra expense with the Lake Carriers' Association.

NEW AIDS TO NAVIGATION.

In October, 1895, the president and the secretary of

the association consulted with the officers of the Light-house Board at Washington with reference to the establishment of a number of new aids to navigation on the Great Lakes. They took with them to Washington a short list of proposed new lights and signals, prepared under the direction of the Committee on Aids to Navigation, and went over each item very carefully with the officers of the Light-house Board. hoping thereby to secure the support of the board and to have the proposed new lights included in the list recommended by the Lighthouse Board for construction, and included in the annual estimates of the Secretary of the Treasury. The proposed new lights were as follows:

A light and fog signal on Middle Island, Lake Huron; a light and fog signal at Crisp's Point, west of White Fish Point, Lake Superior; a light and fog signal on St. Martin's Reef, Lake Huron; a light and fog signal on Rock of Ages, Isle Royale, Lake Superior.

In addition to these new lights we asked that the fog signal at Marquette be located on a crib just inside the end of the pier at that point, instead of on the shore, at a considerable distance from the pier, where it is now placed. We also asked for the placing of the gas buoys as follows:

1. On Graham Shoal, Straits of Mackinaw: 2. On the easterly side of the channel near Grosse Point, half way between light ship and tripod; 3. On southerly point of Fish Island; 4. At three points in the St. Mary's River above the canal, as shown on a chart presented to the board; 5. On the shoal at the southeast point of North Manitou Island, until completion of lighthouse at that point.

When the annual estimates of the Treasury Department were submitted to Congress we were greatly disappointed to find that none of these new lights, which were most urgently needed, were included in the estimates for appropriation at the present session of Congress In spite of this discouraging failure to secure the hearty support of the Lighthouse Board in an attempt to increase the efficiency of the light-house service on the lakes, the association hopes to obtain appropriations for a number of these aids to navigation. A bill authorizing them and appropriating the necessary money will be introduced in Congress within a few days, and the Lighthouse Board will be called upon for a report as to the necessity of each of these lights. As the board is on record in past years as favoring some of these lights it is believed that they will certify to the necessity of some, if not all of them, and a determined effort will then be made to secure appropriation in the Senate for as many as possible. At the last session of Congress, largely by the efforts of Senator McMillan, the appropriation made by the House for general bouyage was increased in the Senate, and the wording of the act changed so as to permit the purchase of gas buoys out of the amount so appropriated. The association was informed by the Lighthouse Board that a certain number of these gas buoys would be put in service in the Great Lakes During the year one of these gas buoys was put in operation in the harbor at Erie, Pa., where it has given the greatest satisfaction. The board also announced its determination to locate buoys at Lansing Shoal, north of Squaw Island, Lake Michigan, and at Poverty Passage, Green Bay, but it is understood that the buoys for these points, which are manufactured in Germany were not completed in time to make it worth while to place them during the past season. They will, however, be placed at the opening of navigation, 1896. It is hoped also that the Lighthouse Board will see its way clear to place some additional gas buoys out of this year's appropriation for buoyage at some of the other points recommended by the association.

EARLY REMOVAL OF LIGHTS AND BUOYS.

The high rates of freight that prevailed during the latter part of the season of 1895 kept the entire lake fleet in commission until navigation was closed by ice. Nevertheless, although practically every large vessel onthe lakes was in commission, some of the most important lights were extinguished, and the work of removing buoys went on as in former years. This is a very difficult matter to deal with, and probably it will always be necessary that the work of removing the buoys should be at least commenced before the actual close of navigation. Nevertheless there were instances during the season just closed which show how unsatisfactory are the present methods of the lighthouse authorities in dealing with this matter. There does not seem to be any good reason why an important light like that on Stannard's Rock, Lake Superior, a light which cost the government nearly $400,000, should be extinguished fully two weeks before the close of navigation, and at a time when the lake fleet is most actively engaged. While perhaps it is impossible for the Lighthouse Board to fix beforehand a date at which important lights should be extinguished and lightships removed, it would appear that at present too much is left to the discretion of the light keepers, whose timidity or desire to finish their season's work doubtless leads to the extinguishment of very important lights before there is any necessity therefor. In the matter of the removal of buoys a typical instance may be given showing how the present system works. On November 25, 1895, the secretary of the association received a telegram from the general manager of the Ogdensburg Transit Company stating that notice had been given that the St. Lawrence River buoys would be removed immediately. As a number of boats of the Ogdensurgb line were yet to go down the river, and as the weather was mild, navigation in full swing, and there was no apparent necessity for the immediate removal of the buoys, which the boats in question greatly needed in order to run the river safely, the Transit Company asked that an effort be made to have the removal of the buoys postponed. Telegrams stating the facts were accordingly sent to the Lightnouse Board and to the Inspector of the lighthouse district in which the buoys in question were located. After a day or two's delay the Lighthouse Board replied that they could not interfere with the discretion of the local officers in such matters. The inspector replied promptly, furnishing the association a copy of a telegram immediately sent by him to the buoy contractor for the St. Lawrence River, who resides at Cape Vincent, N. Y. In his dispatch to this contractor the inspector, Capt. Gridley, stated the facts with regard to the boats of the Transit Company still in commission, and directed the buoy contractor to leave the buoys until the last possible moment. It was believed that this prompt action of the inspector would secure the desired result, and the Transit Company was notified immediately of the inspector's action. The buoy contractor, however, proceeded to remove the buoys immediately, although navigation did not close for at least ten days thereafter. As these aids to navigation are furnished by the government for the protection of vessels, which never need them more than during the last days of navigation, it is believed that vessel owners have just ground to criticise the present system respecting their early removal, and to ask the Lighthouse Board to devise some better method of dealing with the matter, a method which shall leave less to the discretion of the lightkeepers and contractors whose interest is to get through with their work, and which shall have more regard to the protection of the life and property, for the safety of which the buoys exist.

DEATH OF GENERAL POE.

During the past year the members of the association have experienced an inestimable loss in the death of the distinguished engineer officer whose name will be forever connected with the improvements of the lake channels and the development of inland transportation in the United States. The death of General Poe was felt as a profound sorrow by every vessel owner. He was regarded as a tower of strength in all matters that pertained to the protection of the lake waterways and to the progressive development and improvement in the interest of a still greater transportation service. In addition to this, General Poe had become a universal umpire in all matters of dispute in which the interest of vessel owners came into conflict with other interests. His accurate knowledge and his absolute fairness and probity were so universally recognized that he was not only in all cases the chairman of the board selected to pass upon such disputed questions, but the conclusions which were reached by him were recognized in nearly every case, even by the defeated party, as a fair and just disposition of the matter at issue. However able and accomplished the successor of General Poe may be, it must be a long time before he will be able to acquire so profound a knowledge of all the details of the lake transportation, and it will be particularly difficult for him to acquire that comprehensive view of all the elements which go to make up the greatness of the carrying business done on the Great Lakes which was so characteristic of his lamented predecessor and which gave him so genuine an enthusiasm for all the great projects which he originated and to which he gave so many of the best years of his life General Poe's influence with vessel owners, great as it was was no greater than his influence with his superior officers and with Congress; and his splendid presence and fine personality gave all that he said a weight which can hardly be overestimated. In his death the vessel owners have lost their most powerful advocate, as well as a friend for whom they had the greatest respect and affection.

THE CHICAGO DRAINAGE CANAL—LAKE LEVELS.

During the past year the Secretary of War appointed a commission of engineers, of which the late General Poe was chairman, to examine into and report upon the probable effect of the operation of the Chicago Drainage Canal upon the water levels of the Great Lakes. This board made a report preliminary in its nature in which they expressed the opinion that the operation of the canal would have a considerable effect in lowering the levels of the lakes below Lake Superior, stating, however, that further examinations and surveys would have to be made before the amount of such lowering could be definitely ascertained. The board concluded its report by recommending that such further observation be ordered.

The extraordinary low stage of water prevailing during the present season, and a belief that a still further lowering of the water levels will be caused by the operations of the Chicago Canal, have attracted a great deal of attention from all parties connected with lake navigation during the past summer. The large amount of discussion in the public press upon this subject is the best evidence of the widespread interest which is felt in it. Latterly the discussion in the public press has turned upon the possibility of restoring the water levels on the lakes to their normal stage, or even to a higher stage, and of maintaining these levels hereafter uniformly at a fixed point by means of the construction of a system of dams at various points on the chain of lakes. The very great advantages of such a system of controling the lake levels, if the same is found practicable, are easily apparent. While it is a disputed question as to whether there are permanent climatic changes or permanent changes in the channels connecting the Great Lakes which are now operating to lower lake levels, there are some very good reasons for believing that no permanent lowering of the Great Lakes has taken place by reason of either of the causes above named. While the water is now extraordinarily low, it was extraordinarily high so late as 1886. In fact at no time since 1859 has the water on Lake Michigan and Lake Huron been so high as it was in 1886. However this may be, it is an unquestioned fact that the operation of the Chicago Drainage Canal will have more or less effect in permanently lowering the lake levels, and it is also a well-known fact that between the high water of 1886 and the low water now prevailing there is a difference of at least three feet. The adoption of a system of control at the outlets of the various lakes which would prevent wide fluctuations between different seasons and maintain the lake levels at the point which they have heretofore reached during seasons of high water, would be of inestimable benefit. The great advantage, too, of a construction which would operate not only to deepen the connecting channels between the lakes, but at the same time to deepen all the harbors correspondingly, are also obvious. While the United States engineers have not in the past been especially favorable to the proposed method of control by dams, there are indications that a change of opinion is going on in this respect and that a number of government engineers now stationed on the Great Lakes are looking very hopefully towards a solution of the problem of deep water by the use of this method. Resolutions have been introduced in both houses of Congress calling for the necessary observations, surveys and estimates, and it is believed that the association may well give its hearty support to a project which, if found practicable, will do so much for the development of our waterways.

DETROIT RIVER BRIDGE.

A bill has been introduced in both branches of Congress to authorize the construction of a bridge across the Detroit river within the limits of the city of Detroit. The bridge proposed is to consist of three spans, with two piers in the river, each about 600 feet from the shore, with a span 1,100 feet clear between these piers. The bridge is to be 140 feet above the water. It is believed that a determined effort will be made by the advocates of this bridge to secure its authorization by Congress. At the time when the matter of bridging the Detroit river was last actively pushed, an attempt was made to secure the authorization of a so-called winter bridge. At that time the matter was referred to a board of engineers, of which Gen. Poe was chairman, and a report was made by that board against the winter bridge. The board, however, went on in its report to say that a certain type of bridge might be constructed which would not in its opinion be a serious obstruction. It is understood that the pending bill is drawn to meet this portion of the engineers' report, and the promoters of the bridge undoubtedly hope to secure the endorsement of the War Department on the ground that the bridge they propose meets the requirements of the board of engineers, which last reported on the subject. Since then, however, the tunnel at Port Huron has been successfully constructed, and it is believed also that there has been progress in the art of bridge building which makes the old report of the engineers inapplicable to the present day. In addition to this the commerce of the Detroit river has greatly increased, so that now the traffic through the river is much greater than through any waterway in the world. It is interesting also to know that two years ago application was made to Congress for the construction of a bridge across the Hudson river from a point in the upper part of New York city to a corresponding point on the New Jersey shore, and that after a very sharp contest in Congress a bill authorizing a bridge with a clear span much greater than that proposed for Detroit was vetoed by the President, and when a subsequent bill providing for a bridge at this point was passed which left it to the War Department to determine the character of the bridge which should be built, the department reported, after thorough examination, against the placing of any piers in the river and in favor of requiring a suspension bridge at the point in question which should do away entirely with any abutments beyond the pier lines. As the commerce at this point in the Hudson river is small compared with that which exists in the Detroit river, and can never, so far as can now be foreseen, reach any such dimensions as that already attained at Detroit, it is not believed that Congress and the War Department will now authorize the placing of artificial obstructions in the channel at Detroit, especially since the successful completion of the tunnel between Port Huron and Sarnia. Unquestionably, however, the vessel interests will have to make a very vigorous opposition to the proposed bridge, and it is very desirable that at the annual meeting of the association the matter should be discussed and the course of action to be pursued determined.

PROPOSED PATROL FOR ST. MARY'S RIVER.

It has been suggested that inasmuch as navigation in the artificial channels in the St. Mary's river is now carried on under regulations prescribed by the government engineers in charge of the improvements there, it would be a desirable thing to have the jurisdiction of these engineer officers extended to cover all that portion of the St. Mary's river in which navigation is difficult, and

that the necessary authority should be placed in the hands of such engineers to enable them to make rules and regulations to govern all kinds of vessels, as well as rafts, while navigating such parts of the river. It is believed that any regulations that would thus be made would be decidedly in the interest of safety, and that they would largely do away with the collisions and groundings now so frequent in the river and would greatly lessen the risk of a complete stoppage of navigation, a disaster which is so possible that it is always in the minds of vessel owners. It would be impossible by such regulations to cover Canadian vessels while in Canadian waters, unless the co-operation of the Canadian government could be obtained; but if such regulations could be made applicable to all American vessels, whether in American or Canadian waters, and to all Canadian vessels while in American waters, the application of the rule would be so general that the exceptions might be disregarded. Of course if vessel owners voluntarily subject themselves to such regulations it must be upon the condition that rafts also be subject to the same jurisdiction and that power to make regulations governing them also be given to the engineers. The adoption of such a system, also, should be conditional upon some proper method of enforcing the regulations so made, by a system of fines. Probably the Revenue Marine Service would afford the best machinery for detecting offenders and securing general obedience to the rules so made.

The adoption of such a system if well carried out would largely do away with reckless navigation of the river and would also in large part solve the vexed question of regulating rafts; although of course it would still leave the raft question unsettled in the St. Clair and the Detroit rivers.

THE RAFT BILL.

It is the intention of the present Board of Managers of the Association to push vigorously the raft legislation which has been so long advocated by the association and which has not yet been secured. If the new officers and Board of Managers shall be of like mind we believe that this vexed question can be settled at this session of Congress. Steps have already been taken to put the matter in shape for vigorous action after the annual meeting.

In conclusion, your Board of Managers congratulates you upon the prosperous condition of the association and upon the hearty support which has been extended to the board from all vessel owners during the past year. The events of this year have proved that vessel owners have become more than ever before, a united body, capable of dealing unitedly with all matters of common concern, able to stand together and to carry out to the end a course mapped out for them by their elected representatives on the board of managers of this association, and possessed of a new confidence in themselves as a body. We ask for our successors in office the same hearty support which we have ourselves received. We predict that they will receive the same support and that they will accomplish whatever they set out to do in reforming abuses and contributing to the prosperity of the merchant marine of the Great Lakes.

Respectfully submitted on behalf of the Board of Managers, by

WILLIAM LIVINGSTON, President,
CHARLES H. KEEP, Secretary.

FINANCIAL CONDITION OF THE ASSOCIATION.

ANNUAL REPORT OF GEO. P. MCKAY, TREASURER, IN ACCOUNT WITH THE LAKE CARRIERS' ASSOCIATION, COVERING THE FISCAL YEAR ENDING JAN. 7, 1896.

Receipts.

From balance on hand Dec. 24, 1894, as per former report		$ 197.37
Bank's balance		02
Loan from Union National Bank, Cleveland	$ 700.00	
Rebate from Postal Telegraph Co	2.00	
For private lighting	231.00	
Fines imposed on Chicago shipping masters and collected	50.00	983.00
Tonnage dues, 1894		257.61
Tonnage dues, 1895		18.061.84
Total receipts		$19,499.84

Disbursements.

Salaries for 1895, Secretary	$2,000.00		
Treasurer	960.00		
Attorney	1,000.00	3,960.00	
Incidentals, Secretary's office	92.66		
Treasurer's office	41.09	133.75	
Salaries of shipping masters, Cleveland	2,450.00		
Balance of 1894: Cleveland	162.75		
Buffalo	986.00		
Chicago	1,722.50		
South Chicago	600.00		
Ashtabula	640.00		
Toledo	560.00	7,121.25	11,215.00
Expense of shipping offices— Cleveland, Rent	118 73		
Telephone	71.20		
Improvements	540.04		
Provisions, feeding needy sailors	258.56		
Office supplies	194.10	992.70	
Chicago, Rent	405.00		
Telephone	119 94		
Improvements	61.65		
Office supplies	64.00	650.59	
South Chicago, Rent	84.00		
Telephone	19.05		
Office supplies	66.40	169.45	
Buffalo, Rent	112.50		
Telephone	70.00		
Office supplies	105.45	287.95	
Ashtabula, Rent	100.00		
Supplies	45.68	145.68	
Toledo, Rent	100,00		
Supplies	3 55	103.55	2,349,92
To interest on loan from Union National Bank, Cleveland		21.47	
To payment of note held by Union National Bank, in full		700 00	721.47
Traveling expenses of officers and committees of the association			540.20
Aids to navigation—Capt. Wm. S. Mack, expense of ship masters to Washington on account of passing signals act			500.00
Telegraph service			127.16
Printing and stationery			246 45
Maintaining private lights and buoys			2,460.00
Extraordinary expenses, on account of attorney fees, grain shoveling, tug service, entertaining, fuel question, staking Grosse Point channel, printing deep waterways convention resolutions and schooner S. L. Watson case			532.00
To J. A. Calbick, last half dues paid twice and money refunded			22.90
Total disbursements			18,905.03
Balance on hand			594.81
			$19,499.84

In addition to the foregoing I have to report the following unpaid liabilities:

Cleveland shipping office, rent for January, February, March, 1895	41.26	
Chicago shipping office, rent for February and March, 1896	60.00	
South Chicago shipping office, rent for January, February, March '96	36.00	
Buffalo shipping office, rent for January, February, March, 1896	37.50	174.76
Balance of A. R. Rumsey's salary of 1895		200.00
To Andrew Hackett for maintaining float lights and buoys at Ballard's Reef, Milwaukee Shoal and shoals abreast of Amherstburg, from Oct. 21, 1895, to Dec. 4, 1895		600.00
To Duff & Gatfield for maintaining "low water signals" on Mullen & Gatfield's dock at Amherstburg, Ont.; also on Mullen & Gatfield's dock at Sandwich, Ont., from Oct. 21, 1895, to close of season		150.00
		$1,124.76
Unpaid dues for 1895		462 99

GEO. P. MCKAY, Treasurer.

After these reports had been approved on motion, General Counsel Goulder moved the appointment of a committee to procure statistics relative to the volume of commerce passing through Detroit river last season, and of the amount crossing the river last year, with the aggregate ton-mileage, and the freight cost to the public per ton mile. He pointed out that the lake commerce had nearly doubled during the seven years since the last struggle in Congress over the bridge question, and said that while he had not the figures on hand he believed the ton-mileage of the Michigan Central was 1,000,000,000 tons, and the cost per ton mile .007. The freight passing through Detroit river last year approached 30,000,000,000 tons, at a cost per ton mile of less than .0007. He said the committee which should go to Washington should have some unchallenged statistics to present before Congress. Secretary Keep and several newspaper men were appointed upon this committee, with instructions to report at 11 o'clock Thursday morning, when the association would go into executive session on the Detroit river bridge bill.

NOMINATIONS AND ELECTIONS.

The president appointed a committee of seven—Messrs. Wilson, Goulder, Cranage, Dunham, Hadley, Smith (of Buffalo), and Ricketson—to make nominations for committees. These were absent but a few minutes, and returned with the following names:

VICE PRESIDENTS.

H. H. Brown,	Cleveland.	C. A. Eddy,	Bay City.
J. W. Millen,	Detrott	G. G. Hadley,	Toledo.
W. P. Henry.	Bufialo.	James McBrier,	Erie.
J. G. Kent,	Chicago.	Conrad Starke,	Milwaukee.
G. A. Tomlinson,	Duluth.	F. J. Firth,	Philadelphia.
Frank Owen,	Ogdensburg.		

BOARD OF MANAGERS.

S. D. Caldwell,	Buffalo.	D. C. Whitney,	Detroit.
Peter P. Miller,	Buffalo.	Wm. Livingston,	Detroit.
E. T. Evans,	Buffalo.	A. A. Parker,	De roit.
James Ash.	Buffalo.	J. W. Wescott,	Detroit.
W. Bullard,	Buffalo.	D. T. Helm,	Chicago.
J. J. H. Brown,	Buffalo.	Jesse Spaulding,	Chicago.
W. C. Rinearson,	Buffalo.	J. S. Dunham,	Chicago.
John Rice,	Buffalo.	John Keith,	Chicago.
M. M. Drake,	Buffalo.	Jos. Austrian,	Chicago.
W. P. Henry,	Buffalo.	W. R. Owen,	Chicago.
Edward Smith,	Buffalo.	C. W. Elphicke,	Chicago.
James McKenzie,	Buffalo.	W. M. Egan,	Chicago.
H. C. French,	Buffalo.	J. J. Rardon,	Chicago.
Thomas Wilson,	Cleveland.	James A. Calbick,	Chicago.
M. A. Bradley,	Cleveland.	George G. Hadley,	Toledo.
James Corrigan,	Cleveland.	W. S. Brainard,	Toledo.
H. M. Hanna,	Cleveland.	L. S. Sullivan.	Toledo.
George B. McKay,	Cleveland.	James Davidson,	Bay City.
H. G. Dalton,	Cleveland.	Charles A. Eddy,	Bay City.
Harvey H. Brown,	Cleveland.	O. W. Blodget,	Bay City.
John W. Moore,	Cleveland.	F. W. Wheeler,	Bay City.
B. L. Pennington,	Cleveland.	B. Boutelle,	Bay City.
John Corrigan,	Cleveland.	Thos. Cranage,	Bay City.
W. J. White,	Cleveland.	J. W. McGraw,	Bay City.
Henry A. Hawgood,	Cleveland.	Alex. McDougal,	Duluth.
W. C. Richardson,	Cleveland.	F. N. LaSalle,	Duluth.
J. C. Gilchrist,	Cleveland.	A. B. Wolvin,	Duluto.
W. D. Rees,	Cleveland.	G. A. Tomlinson,	Duluth.
John Mitchell,	Cleveland.	David Vance,	Milwaukee.
R. R. Rhodes,	Cleveland.	R. P. Fitzgerald,	Milwaukee.
Caleb E. Gowen,	Cleveland.	J. C. Ricketson,	Milwaukee.
Wm. S. Mack,	Cleveland.	Conrad Starke,	Milwaukee.
C. E. Benham,	Cleveland.	F. W. Gilchrist,	Alpena.
P. J. Minch,	Cleveland.	Alvin Neal.	Port Huron.
C. F. Palmer.	Cleveland.	C. T. Morley,	Marine City.
James W. Millen.	Detroit.	R. E. Schuck,	Sandusky.
W. Livingstone	Detroit.	Frank J. Firth,	Philadelphia.
David Carter,	Detroit.	Frank Owen,	Ogdensburg.
E. M. Peck,	Detroit.		

COMMITTEE ON FINANCE.

H. M. Hanna,	Cleveland.	D. C. Whitney,	Detroit.
H. H. Brown,	Cleveland.	W. P. Henry,	Buffalo.
James Corrigan,	Cleveland.	J. J. H. Brown,	Buffalo.
H. A. Hawgood,	Cleveland.	David Vance,	Milwaukee.
Thos. Wilson,	Cfeveland.	R. P. Fitzgerald,	Milwaukee.
M. A. Bradley,	Cleveland.	John G. Keith,	Chicago.
J. C. Gilchrist.	Cleveland.	J. S. Dunham,	Chicago.
E. M. Peck,	Detroit.		

COMMITTEE ON LEGISLATION.

S. D. Caldwell,	Buffalo.	James Corrigan,	Cleveland.
James Ash,	Buffalo.	Wm. Livingston,	Detroit.
E. T. Evans,	Buffalo.	James Millen,	Detroit.
P. P. Miller,	Buffalo.	Jesse Spaulding,	Chicgo.
H. C. French,	Buffalo.	C. A. Eddy,	Bay City.
W. Bullard,	Buffalo.	Alex. McDougal,	Dulnth.
Edward Smith,	Buffalo.	F. J. Firth,	Philadelphia.
H. M. Hanna,	Cleveland.		

COMMITTEE ON AIDS TO NAVIGATION.

George P. McKay,	Cleveland.	W. M. Egan,	Chicago
W. C. Richardson,	Cleveland.	Frank Owen,	Ogdensburg.
H. G. Dalton,	Cleveland.	A. W. Colton,	Toledo.
B. L. Pennington,	Clevclxnd.	James Davidson,	Bay City.
Thomas Wilson,	Cleveland.	Alvin Neal,	Port Huron.
John W. Moore,	Cleveland.	M. M. Drake,	Buffalo.
W. S. Mack,	Cleveland.	W. Bullard,	Buffalo.
David C. Carter,	Detroit.		

Mr. James Corrigan then presented the name of Capt. J. H. H. Brown for the presidency of the association for the coming year. His nomination was seconded by Capt. James Davidson, of West Bay city, and the selection was made unanimous.

On motion of Capt. Thomas Wilson, seconded from all parts of the hall, Secretary C. H. Keep, Treasurer George P. McKay, and General Counsel Harvey D. Goulder were selected for another year. The retiring officers were given a vote of thanks and a recess for lunch was taken.

The Lake Carriers reassembled at 2:30 and on motion of B. L. Pennington the annual dues were fixed at 3c per ton.

PATROLLING THE SAULT.

Capt. W. S. Mack then made a few remarks, by unanimous consent, on the passage of vessels through the Sault, and read a telegraphic recommendation from the Maritime Board of the Cleveland Chamber of Commerce that the Lake Carriers' Association appoint a committee to confer with Capt. Davis, of the revenue cutter Andrew Johnson, who is investigating the subject of the desirability of establishing a patrol system in the Sault. Capt. Mack moved for the appointment of this committee and was selected as chairman, with Capts. Mack, Wilson, McKay, Henry, Calbick, Millen and Davidson as associates.

NORTH MANITOU LIGHT.

Owing to the impossibility of securing a clear title to land selected for a light and fog signal on North Manitou Island, no work has been done on this light, although an appropriation has been made. Mr. Goulder read a letter from Jos. Austrian, complaining of the delay, and made a motion, which was agreed to, that President

Brown and Secretary Keep effect a special arrangement by which a temporary fog signal can be established from the opening of navigation this year until such time as the land can be legally acquired by condemnation proceedings.

THE FUELING AGREEMENT

was then taken up, and Mr. James Corrigan moved the appointment of a committee to secure absolute liberty fuel at any Lake Erie ports where vessels pleased, regardless of the points where the coal is loaded. The idea was to effect the same reform at Lake Erie soft coal ports as well as at Buffalo. Mr. G. G. Hadley, of Toledo, was asked for a few remarks. He said he thought fueling had been reduced to a fair price all along Lake Erie ports. The difference between fuel and cargo rates amounted to only about 15 cents per ton. He spoke of the combination of Ohio coal-producers this year, and said that the Pennsylvania producers expect to join the combination within thirty days. He suggested that a committee of the Lake Carriers should appear before the new organization. The price of fuel, he said, would not be fixed until the coal-carrying roads got together and fixed the freight rates.

Mr. H. A. Grimmell, of Buffalo, a coal shipper, was also allowed the floor, and said that the "no fuel no load" had originated in Ohio, and had been carried out last year, despite the Buffalo struggle. He said the shippers had never met in 1894 to fix the price of fuel except when the outside fuel docks were represented. He said that with one or two exceptions the coal shippers had endeavored to deal fairly. He laid stress on the fact that they had to pay 30c more freight on fuel than the Ohio fuel docks did. He stated that during the strike in the spring of 1894, his firm had disposed of fuel at lower rates than they could have obtained elsewhere, while at the same time a ship owning firm had held off on a pile which it had in stock, and sold its coal at a decided advance. He argued in favor of allowing the vessels to fuel with shippers when they so desired.

Capt. Millen said the agreement had resulted so well last summer that no backward steps should be taken. He favored extending the provisions of the agreement of 1895 be extended to the soft coal shippers in Ohio. His remarks were echoed by Messrs. Calbick and H. A. Hawgood. Mr. B. L. Pennington was disposed to be conciliatory and moved that the "boycott" against the coal shippers be raised, and vessels allowed next season to fuel with the shippers if they wished. He thought, however, that the shippers, on the other hand, should give perfect liberty to the vessel to fuel where the owners think it to their interest.

Mr. Goulder asked Mr. Grimmell to state what was the attitude of the hard coal shippers toward the vessels next season. The latter replied that the shippers had had no meeting, but he thought if absolute freedom in this matter should be enjoyed by the vessels, and they felt confident that then each would get his share of fueling. He mentioned the fact that Ohio shippers had occasionally made a rate of 5c less for loading consorts, and had in several cases demanded a bonus.

Capt. Thos. Wilson said he had not been in to hear the entire discussion, but that the word "boycott" should never have a place in the proceedings of the Lake Carriers' Association. He didn't want to speak for the coal shippers, but he wanted to see fair play. If a vessel could do as well at a shipper's dock, she should be allowed to fuel there.

A committee consisting of J. W. Millen, James Corrigan, John Rice, G. G. Hadley, David Vance, B. L. Pennington, M. A. Bradley, W. S. Mack and Thomas Wilson were appointed a committee to meet with the fuel men at 8:30 Thursday, and report later.

GRAIN SHOVELING AND SHORTAGES.

Mr. Pennington brought up the grain shoveling question and spoke of the thousands of dollars saved to the vessel owners under the Kennedy contract, and offered the following resolution, which was unanimously adopted:

WHEREAS, The members of the Lake Carriers' Association, whose tonnage has been employed in the grain trade, have been unloaded at Buffalo under a contract with James Kennedy during the past season, said contract and service having been satisfactory to the vessel interests, it is therefore

Resolved, That the Lake Carriers' Association hereby express its appreciation of said service under said contract with James Kennedy, and instructs the secretary of this association to renew said contract with said Kennedy under the same conditions for the ensuing year.

Mr. Hawgood then brought up the question of grain shortages, and moved that a committee of five be appointed to consider this question. Mr. Junius S. Smith, Board of Trade Weigh-master of Buffalo. was invited to the floor, and gave a few interesting statements in this connection. Capt. Dunham, of Chicago, asked that a committee consider also the question of overruns, and this was agreed to. The committee, when authorized to vote, was appointed as follows: Captains J. C. Gilchrist, James Davidson, Thomas Wilson, J. H. Dunham and C. A. Eddy.

President Brown appointed a committee of M. A. Bradley, David Vance and Alvin Neal to consider a resolution which had been offered, giving the Lake Carriers' approval to the movement for the extension of Buffalo breakwater, and to consider other local questions of similar nature which might be offered.

UNNECESSARY LIBELING OF VESSELS.

General Counsel Harvey D. Goulder was then called to the floor to discuss the question of libeling vessels by irresponsible parties, which results in the piling up of costs for $36 for merely filing papers. Each party, he said, was assessed his own costs, but the libelant was usually not good for any costs, and he had never settled any of these costs, even when the claim was not pushed, for less than $50 to $90. He said some had suggested legislation on the subject, but that this was unnecessary. He had talked to two district judges, with whom the matter largely rests, and they had stated that they would be glad to consider any plan to obviate this abuse which might be suggested by the Lake Carrier's association. He suggested the appointment of a committee to formulate a plan. This was agreed to, and President Brown, Secretary Keep, and General Counsel Goulder will form this committee.

LIGHTHOUSE DISTRICT BOUNDARIES.

Capt. George P. McKay offered a motion that action be taken looking to a change of the boundary line between the Ninth and Tenth lighthouse districts, so that the lights at the foot of the river would be placed in the Tenth district, in order that when these lights were displaced they could be replaced with less delay if they were under the care of the Detroit headquarters, rather than those at Buffalo, had charge of the matter. This was unanimously assented to.

Capt. W. S. Mack called attention to the fact that the shoal at the upper middle ground, St. Clair River, opposite the north of Black River. He said he would sooner do without a light somewhere and know this important channel was open. He moved that the secretary be instructed to the measures to secure an appropriation in dredging out this shoal. This carried unanimously without discussion.

Mr. B. L. Pennington spoke at some length on the valuable assistance which the ship masters had given to the Lake Carriers' Association last year, and pointed out that the Ship Masters' Association would meet at Washington next week. He moved a vote of thanks, and a request that they continue the good work. This carried with a shout.

HYDRAULICS OF THE LAKES.

Secretary Keep then laid before the meeting the resolutions of Senator Brice and Representative Griswold setting on foot an investigation of the lake levels, and means for raising them; and Mr. Keep moved that the association take action approving these resolutions, and ask the Secretary of War to act in harmony with this movement. The association then adjourned for the day.

THURSDAY'S PROCEEDINGS.

When the Lake Carriers assembled Thursday morning they at once took up the matter of memorial action on the death of Gen. Orlando M. Poe, Engineer Corps, U. S. A., in charge of the Sault passage and the 20-foot channel improvements. They were addressed on this subject by Gen. S. A. Alger, a warm personal friend of the late General Poe, who pronounced a eulogy on his steadfast loyalty to the lake carrying interests and to his high personal character. At the close of General Alger's remarks, a committee was upon motion appointed, consisting of Ex-President William Livingston, Gen. Russell A. Alger, J. C. Gilchrist, S. D. Caldwell, E. T. Evans, C. W. Elphicke, Thomas Cranage, Alex McDougall and David Vance, to take active action and report upon the matter of a memorial tablet or stone in honor of the deceased, and to use every effort to secure the enactment of pending legislation securing a pension for his family. A communication from R. J. Cram, stating that the contractors desired to cooperate in the erection of a tablet, was later referred to this committee.

PATROL OF THE SAULT.

The committee to which had been assigned the duty of considering the needs of regulating the passage of vessels through the Sault then presented its report which was unanimously adopted as follows:

Your committee appointed on the question of the navigation of the St. Mary's River beg to report,

1—That the suggestions of Capt. Davis, of the U. S. Revenue Cutter service, as to the great and growing danger of navigating this river are timely.

2—That the danger and the frequency of collision in that waterway are the result of the present system of navigating.

3—That the men navigating the St. Mary's river are competent and able, but emulation and rivalry in the matter of making quick trips practically compel them to take undue risks.

4—That the matter can be regulated by the government, provided suitable provision is made for the enforcement of proper regulations.

5—Your committee recommend that the Lake Carriers association call upon the government to establish suitable, reasonable and practical regulations, with suitable provisions for the rigorous enforcement of such regulations.

These resolutions were accompanied by a memorial asking Congress to direct the Secretary of the Treasury to frame proper regulations for the passage of boats through the St. Mary's river, and to arrange for their enforcement by stationing one of the revenue cutters in the Sault.

THE DETROIT RIVER BRIDGE QUESTION.

The committee appointed to prepare statistics upon the amounts of freight passing through and across Detroit river reported that the aggregate tonnage passing through the river for the season of 1895 was 29,860,000 tons. This was carried, on an average, 750 miles, giving a ton-mileage of over 22,000,000,000, at a cost to the public in freight charges of .00085 cents, or 85-100ths of a mill per ton. The total ton-mileage of the entire railroad service in the United States for 1894 was 82,000,000,000, and allowing for a large increase during 1895, the lake ton-mileage for the eight months of navigation was over one-fourth that of all the railroads in the country for the entire year. The freight cost to the people for freight transportation by rail is about .0055 cents, or 5½ mills per ton mile. The cost by lake is one-tenth of the rail average and one-seventh of the cheapest rail transportation on record. Taken in comparison with the freight passing across Detroit river which would make use of the bridge, the report shows that the volume of lake freight for eight months is considerably more than twenty times that of the rail freight which would cross the bridge during the entire year.

This report was received and adopted, and the Lake Carriers' Association then went into executive session to talk over the bridge question. There was little or no difference of opinion on this subject, and it was informally resolved that the Lake Carriers' Association was unalterably opposed to the construction of any bridge which would place piers or other obstructions in the river. The members felt that they were not asking the impossible, as some remarks by ex-President Livingstone and General Counsel Goulder showed that a 3200 foot single span across North River at New York was being considered, while a single span across Detroit River need not be over three-quarters that length. The other engineering problems at New York bore the same proportion of difficulty in comparison with the situation at Detroit. Secretary Keep was instructed to draw up a memorial to Congress as the action of the association, setting forth in detail the reasons for the opposition of the association, as presented by the members in the discussion. The officers of the association were directed and authorized to appoint a committee to go to Washington at the proper time to present the claims of the lake interests before Congress. This committee, however, will include the executive officers.

GRAIN SHORTAGES.

The committee to which was referred the question of grain shortages and overruns made the following report, which was adopted:

Your committee have met with Mr. Junius S. Smith,

CONTINUED ON PAGE 18.

THE KING ORE HOISTS AND CONVEYORS.

(SEE ILLUSTRATION).

The accompanying illustration will probably be of interest to railroads and other parties operating and connected with handling ore and coal from vessels to docks and cars and vice versa. It will give a general idea of a plant of this description recently designed and built under patents and rights granted The King Bridge Co., of Cleveland, on the docks of the P., Y. & A. Ry. Co., at Ashtabula, O., operated by M. A. Hanna & Co.

Although perhaps the King Bridge Co. is not widely known as in this line of business, they have built a number of machines of this character, the first being as far back as 1882, which is probably the first plant of the kind known, built for handling ore and coal in this manner.

Although the machine shown in the illustration does not vary a great deal from the earlier type built by this company, it is vastly superior in the improvements that have through long experience been found to be of benefit in despatch and economical maintenance, which means so much when the shortness of the navigation season upon the lakes is considered.

As will be seen, the hoists are built entirely of wrought and cast steel which has been subjected to thorough inspection throughout its manufacture. Care has been taken that the structure should be well designed and detailed from an engineering standpoint, which is of the first importance when the very hard usage that is required of it is considered, which point is ordinarily overlooked in other plants designed for similar work, where the design in detail is generally of such a description as should not be accepted by railroad or bridge engineers for structural work of any description.

The hoists shown in illustration are arranged in pairs; that is, two bridges have one support in common at the rear, designated as the rear tower, while there is a separate support or leg at the front for each bridge. All of the towers are supported on wheels placed on substantial tracks, consisting of two rails at the rear and one in front. The moving of the plant from one point to another is done by steam or electric power at the rear, and at the front by means of hand gearing.

The bridges are hinged to each side of the top of rear tower and at the top of the front tower they are hung by means of adjustable connections. This mode of attachment allows the bridge or projecting apron, without being strained in the least, to be operated directly from the hatchway of a boat without moving the whole machine.

The principal dimensions of the machine are 180 feet between towers, with 88 feet cantilever and 34 feet apron on front tower which can be raised and lowered by power at will so as not to interfere with the masts of vessels when they are taking position in front of the plant. There is a clear space under the bridges from top of dock of about 30 feet, which gives ample room for storage purposes, providing it is not convenient to unload a vessel directly into the cars. The bridges are on a grade to increase the storage capacity of the dock.

In arranging and placing the operating machinery for a plant of this kind, the primary object in view was to combine the greatest possible efficiency with a simple and durable design, for while the work per day expeeted of a machine of this kind is considerable, yet at the same time the men who operate it are not apt to be skilled mechanics with an understanding of the proper endurance of a piece of machinery. It becomes, therefore, imperative to the successful operation of the plant that there be few points depending on the judgment of the operator for their being kept in good condition. Keeping this in view, the design has been to confine all machinery to the engine room, where it is under the constant watch of the engineer, and outside the engine room on the bridge are only the sheaves and steel ropes, not so apt to get out of order and not requiring constant attention.

The hoisting engines used on the plant described are of the well-known Lidgerwood pattern, with reversible link motion, and these, together with the boilers, etc., are placed in an engine room built in the rear tower from which two legs on bridges are operated. The rear tower is also propelled up and down its track on the dock by a gearing machine located in the engine house from which also power is furnished to raise and lower the apron at the front tower. The bridge is constructed with an upper and lower runway, the upper forming the track for the hoisting and the lower for the conveying carriage from which are operated wire conveying ropes to which the buckets are attached and can be operated so that the bucket can be hoisted and conveyed at the same time and take the shortest line between two points and be stopped at any height and place. It does not have to be brought directly in contact with the carriage before the conveying takes place, and requires no complicated latch mechanism, as is usually employed in machinery of this description, which is a point of great benefit to this machine in the matter of time of operation and simplicity of construction.

The plant which the King Bridge Co. has just built at Ashtabula has thus far given entire satisfaction and when it had only been in operation a few weeks, the party for whom it was built ordered an additional set of two legs, which is now being constructed ready for operation next spring. The dock will then have a plant of ten legs, which is now considered no more than enough to handle boats of the latest style, which are designed some 432 feet in length over all, with 12 hatches, and a capacity of 6,680 net tons of ore on 19 feet draft.

Mr. George B. Raser, the manager of the P. Y. & A. dock at Ashtabula, O., selecting at random from his reports, advises that on September 26, 1895, the steamer Roman, with 2,500 tons of ore, commenced unloading in cars at 6:30 a. m., and finished at 5:30 p. m., and on September 28, 1895, the steamer German, with 2,540 tons of ore, commenced unloading in pile at 7:00 a. m., and finished at 5:30 p. m. An allowance, in each case, of course, should be made for a shut-down of one hour at noon, and in neither of these cases was any special effort made to obtain a record of special good showing. They represent the average daily work of the eight legs in the plant, which will, of course, be increased when the others are in operation. It should also be remembered that this work was done when the plant was new and the operators new to it, and it has been found that later in the season, when they had acquired more experience in handling the machinery better time was made.

Although the foregoing reports are for average work each day under ordinary circumstances, they do not represent the actual efficiency of the hoists, as these boats were unloaded into cars standing on the two tracks near the water front, and not into pile, and there is, of course, always a loss of time from switching necessary in pulling out the loaded cars and replacing them with empties, which consumes from 30 to 50 per cent of the time. This loss of time occurs in a large measure for the reason that the hoists are necessarily very close together, on account of the short distance between the hatches in the vessel; and therefore the cars have to be placed alternalely on the tracks and one hoist can only have one car to load in at a time, and while this is being taken away and replaced by an empty, the hoist must necessarily lie idle. This is under the present arrangement of operating the tracks at the plant under discussion, but we understand that it is the intention of the managers of the dock to add two more tracks, making the number four in all, in order to be able to place two cars under each hoist at the same time, thus making the work continuous, so that there need be no interruption in hoisting for lack of cars. This will, of course, lose a certain amount of space for storage, but when direct shipment from vessel to cars is the principal requirement in a very busy season, the storage capacity of the dock is a secondary matter, and towards the close of the season can be increased, if necessary, by simply doing away with the two additional tracks, and using the room for the purpose of storage. This mode of rapid unloading by con-

PORTABLE HOISTING AND CONVEYING PLANT.

P., Y. & A. Ore Docks, Ashtabula, Patented, Designed and Built by the King Bridge Co., Cleveland.

tinuous work only becomes practical when it is possible to stop and start the conveying carriage at any desired point without changing any stops or other parts of the bridge, and it is one of the great advantages claimed for this hoist that it is possible to do this without the operator leaving either of his two levers, and it should be further stated that it is the only hoist designed for direct loading into cars of ore as well as storage where it is accomplished so simply.

The general arrangement of machinery, mode of operation and important details and various safety devices are all covered by the Rasch and other patents controlled by the King Bridge Co., and it is their intention to operate this branch of their business hereafter more extensively than they have formerly done. They are also at present engaged in perfecting a coal handling device for unloading cars directly into boats, of which we shall probably be able to give a description later.

LAKE CARRIERS' ASSOCIATION.

CONTINUED FROM PAGE 16.

special weighmaster at Buffalo, and have considered the facts presented to them by him, showing the gradual but steady reduction in grain shortages at Buffalo, which have been reduced to less than one-fourth of their former proportions by the introduction of a system involving tallying by competent men, frequent testing of all elevator scales, investigation of all considerable shortages and overruns, by looking up the records of the loading and unloading elevators, and procuri ng tests of their scales, etc., and examination of all methods of delivery. Under this system a very valuable record of all elevators along the lakes has been obtained, and the weighing of grain is being made yearly by better construction of the elevators, better system of weighing, and more careful attention to all the details of a complicated matter.

All the weighing at each port where the grain trade is carried on could be done by one man, who could thus get complete records and be able to look up and investigate, both at the loading and unloading ports, all cases involving any considerable shortage. The system could be brought to much greater perfection and better results obtained; and since shortages are much more frequent than overruns, money could be saved to vessel owners. In the interest of greater accuracy and smaller payments for shortages, your committee therefore recommends to members of the association that they have their weighing at Buffalo and all other grain ports done by the official weighmaster at each port; that a circular embodying this recommendation and explaining the reason, therefor, be sent to each member by the secretary.

FUELING STILL UNSETTLED.

Tne coal shippers and fuel dealers were well represented at the meeting and many of them discussed the situation before the committee Thursday morning. Chairman Millen, when the report was called for, asked for further time. Mr. A. A. Parker moved that further time be granted and that the committee be given full power to act, Capt. Dunham suggested that the committee be made permanent, and Mr. Parker accepted the amendment. It was at first desired by some members that they should report the finance committee before taking any final action but Mr. Pennington pointed out that the most the committee could accomplish in any event would be to draw up agreements between the coal shippers and fuel men at Lake Erie ports, and the one side, and individual vessel owners on the other. The agreement would be binding only upon signers, as the association was not empowered to take action limiting the individual rights of members. Mr. Parker's motion then prevailed on a rising vote, which was unanimous.

BETTER NEWS FACILITIES.

On motion of Mr. John Corrigan, the secretary was directed to do what he could to influence telegraph companies to locate offices at Detour and on one of the Manitou Islands, to give additional information regarding vessel passages. President Brown suggested some provisions be made for securing information as to the time of arrivals and departures at the chief lake ports. The daily newspaper reports of port lists were critisized as inaccurate, and Mr. Homer J. Carr, manager of the Lake Marine News Association, pointed out that the inaccuracies were due to the carelessness of masters, who often took out clearances with inaccurate manifests, merely to save time. Some suggestions were made regarding a cipher telegraph code for the use of members of the Association.

A vote of thanks was tendered retiring president Livingston for the handsome way in which he entertained the visitors at the Detroit Opera House; also to the Detroit Art Association, which had invited the members to an exhibition of photographs at its rooms.

VESSEL BROKERS AND AGENTS.

Mr. G. G. Hadley then presented the following:

Resolved, That the Lake Carriers' Association condemns the action of brokers in contracting for transportation of large quantities of coal and ore, and then bearing freight rates with a view to increasing profits on such transactions.

Mr. John Corrigan gave this resolution a vigorous second, and said that the question was purely one of common honesty. Mr. Livingston said that a vessel broker was supposed to look after the interests of his customers, who were his clients; and for a broker to work against the vessel interests for his own profit was as improper and dishonorable as for the counsel of the association to accept a retainer from the projectors of the Detroit river bridge. Capt. C. E. Benham said that the fault lay partly with the owners. There were brokers who took these contracts and there were others who did not. He was a broker of the latter class, and he had noticed that many vessel owners, with full knowledge of these transactions, had continued to patronize brokers who worked in opposition to their interests.

President Brown said that the terms vessel broker and vessel agent had become somewhat mixed on the lakes. A vessel broker was in legitimate business when he made a speculative contract for carrying blocks of coal or ore; but the fact that he did this business disqualified him for acting in the capacity of vessel agent, who was supposed to act solely for the vessel. He suggested that Capt. Benham have his sign changed. A recess for lunch was then taken. The same matter was brought up after lunch, very vigorous speeches being made. Mr. Hadley said that brokers had, in times past, contracted to carry blocks of his coal at a certain rate, and had afterwards offered the same coal to his vessels to carry at a lower rate, charging commission at the same time. This was unjust to him, both as a shipper and an owner. Shippers were indifferent about the amount of the freight rate, so it was the same for all. The freight rate, if uniform, would simply be added to the selling price of the coal. So long as it was not uniform, each shipper would strive for such advantages as he could get. He said that on Lake Michigan one firm would soon contract for coal, this setting the price for all the coal which would go to Lake Michigan. He wanted to know if the vessel owners were going to let this firm run their business next year as it had done in former years, or whether they would run it themselves. His remarks were received with applause, and his resolution adopted. The action of the meeting was, however, later criticised by Mr. Corrigan as insufficient, and he offered the following resolution, which was adopted with the same enthusiasm.

Resolved, That no member, particularly owners and agents, contract for the transportation of any commodities without naming the vessel at the time of contract, thereby preventing the most ruinous practice now confronting the vessel interests.

MISCELLANEOUS MATTERS.

Capt. Alex. McDougall offered a resolution directing the secretary and counsel to make an effort to stop abuses connected with reporting and clearing at custom houses and reporting to engineers in charge of improvements, particularly the latter. Capt. McDougall, in his remarks, took exception to the whole system, which he claimed was burdensome and unnecessary. His resolution was adopted.

Capt. J. C. Ricketson, of Milwaukee, offered a resolution declaring it the sense of the meeting that a shipping office was needed at Milwaukee. Referred to finance committee.

A resolution, presented by Mr. Livingston, was adopted, giving the Hydrographic Office and its work on the lakes the hearty endorsement of the association, and expressing the sense of the meeting that other branches should be established at Buffalo, Detroit, Sault Ste. Marie, and Duluth.

J. W. Westcott offered the preamble and resolution adopted by the Deep Waterways Convention at Cleveland in October, which were adopted by the Lake Carriers. The resolution is as follows:

Resolved, That the present proportion of the traffic and its rapid increase render it imperative for reasonably safe navigation that the channels of St. Mary's river be enlarged to at least 500 feet; the Limekiln Crossing to at least 600 feet; and that of the St. Clair Flats came to 600 feet by the addition of a 300-foot passage alongside the present westerly pier. It is the unanimous vote of the convention that the government be urged to take up these works, and carry them to completion at the earliest possible moment.

Capt. George P. McKay moved that the secretary be instructed to take up the matter of desired aids to navigation in Canadian waters with the Canadian officials by correspondence at once; and that if it be deemed desirable, the executive officers of the association be authorized to visit Ottawa and present the matter in the best manner possible to government engineers and others whose influence may bring about these improvements.

In support of his motion, which was adopted, Capt. McKay recited the facts regarding the situation near Pointe au Pelee and between Amherstburg and Bois Blanc Island, which caused so many strandings in those localities last year.

In view of action taken by certain Canadian vessel captains, Capt. W. S. Mack offered a resolution placing at the service of the United States government, in the event of any future hostilities the vessels of members of the association. This was carried.

On motion of Mr. Livingston, the following was adopred:

WHEREAS, This association has since the last meeting lost by death one of its members who was highly esteemed and respected all over the lakes, and who was at all times a most loyal and devoted friend of every cause which the association had at heart, and who could be counted on for vigorous and good courage in fighting the battles of the vessel owners,

Resolved, That this association sincerely deplores the death of Capt. John Shaw, and reverently pays this tribute of respect to his memory.

Adjournment was taken at 4 o'clock, after which the finance committee held a short meeting.

DULUTH AND SUPERIOR.

Special Correspondence to The Marine Record.

Three more steel shovels have been ordered for mining on the Mesaba range—one at the Mahoning, one at the Elba and one at the Genoa. The Mesaba range shipped 2,760,000 tons last year.

The lumber market during the past week has been rather quiet, but lumbermen are inclined to think that things will be more prosperous from now until spring. The lumber for the ore docks at Two Harbors and Allouez Bay is being furnished by local firms.

The dredging firm of Williams, Dougherty & Upham has dissolved partnership, the two latter gentlemen disposing of their interests to Mr. E. T. Williams, of Chicago, the senior member of the firm. His two elder sons will probably have active charge of the business.

The largest fire that has appeared on the Superior docks this season broke out last Thursday in the stock of the Ohio Coal Co. The pile consisted of 12,000 tons, of which 3,000 tons were badly damaged.

President Saunders, of the Northwestern Coal Co., has ordered the erection of a second section of the big dock in Allouez Bay. The dock was originally laid out in six sections, to have a capacity of 2,000,000 tons. The first section, now in use, has a capacity of 300,000 tons. The construction of the second section will a little more than double this capacity. The No. 2 dock in Duluth will be used till the capacity of the Allouez Bay dock will be sufficient to accommodate the business of the company.

BUFFALO.

Special Correspondence to The Marine Record.

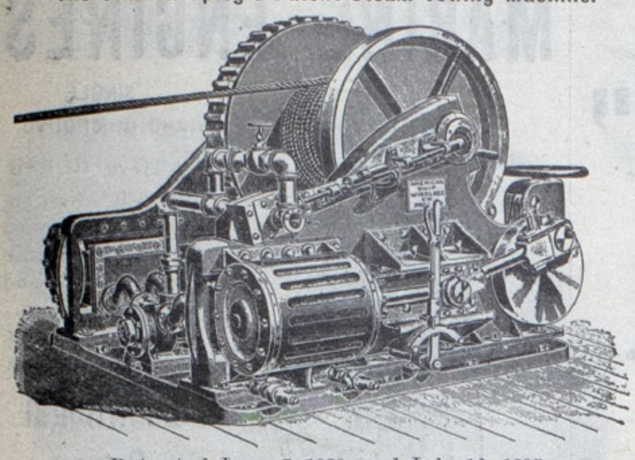
As a result of the extensive dredging job being done in the Ohio basin, a number of docks have been undermined, owing to the shortness of their piling. Among them are the docks of Mann Bros., and the Buffalo Box Co. The Buffalo Dredging Co. is deepening the channel to 19 feet, but a further appropriation of $18,000 must be made before the work is completed. The company laid up all its dredges for the season Thursday, but the drill boats will be kept at work on the reef above the turnpike bridge all winter. The channel is to be 140 feet wide and over 2,500 feet long. The contract calls for 19 feet of water, and the dredging company says there will be 20 feet. The work is being done under a state appropriation.

The hearing of the Buffalo people on the need of the proposed breakwater extension will probably occur before the River and Harbor Committee of the House, between January 21 and February 1.

Division Engineer J. L. Little of the State Engineers' Department has selected his assistants for the work on the canal improvement on the Erie canal. The canal is divided into eleven sections and each engineer is allowed twelve assistants, beside laborers.

The tug North Muskegon will receive a thorough r-a build at Burger & Burger's yard, Manitowoc.

The Shaw & Spiegle Patent Steam Towing Machine.



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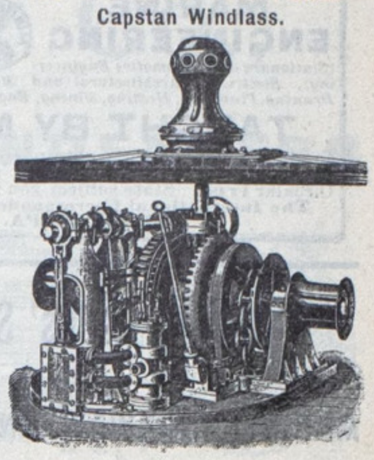

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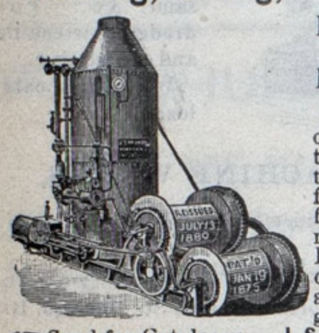

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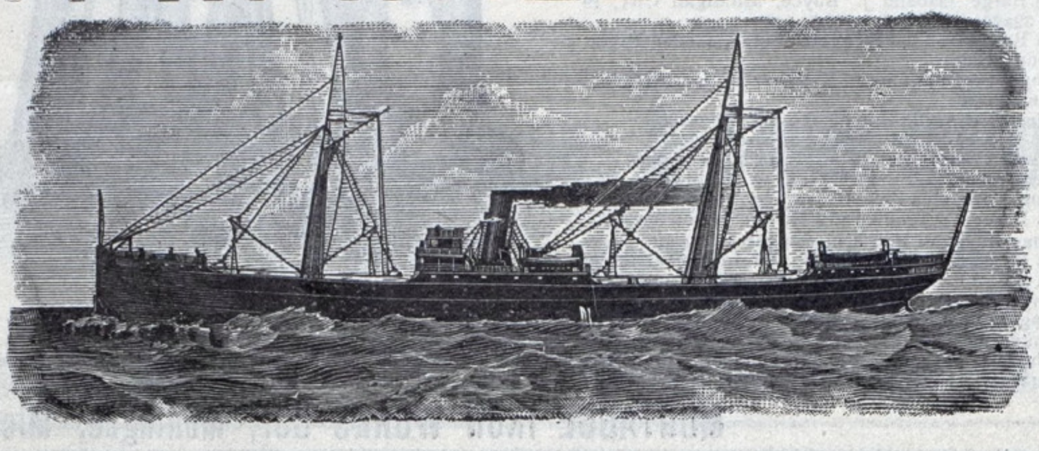

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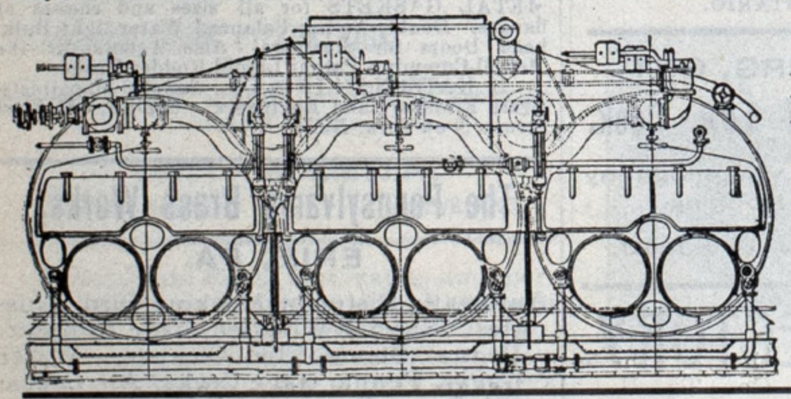

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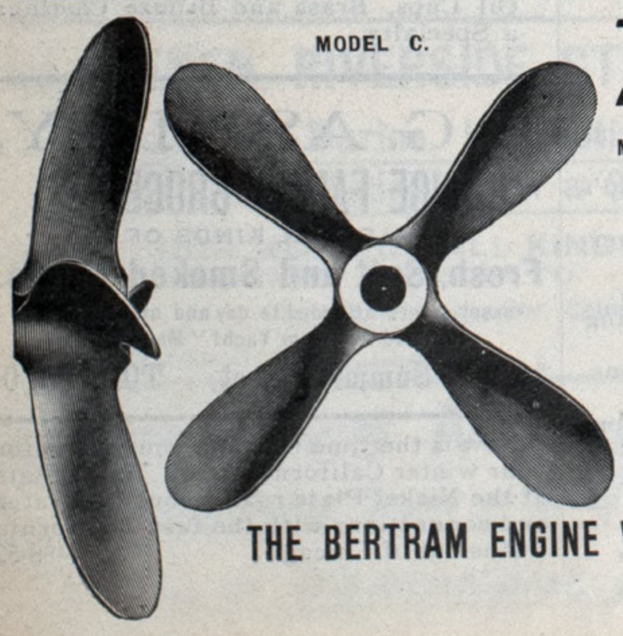

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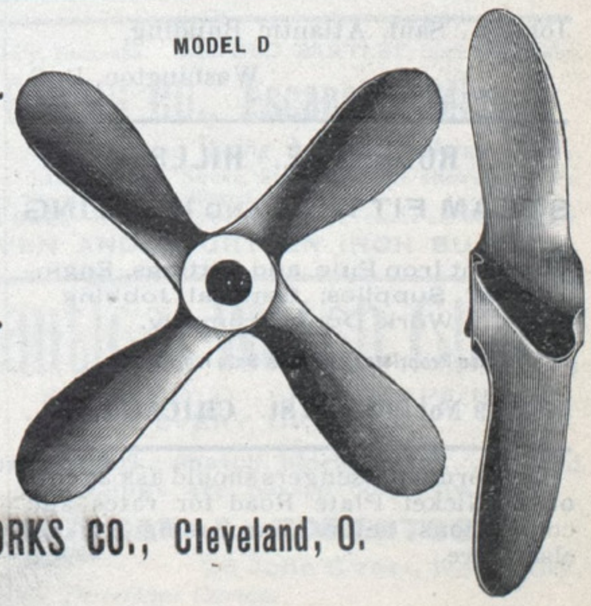

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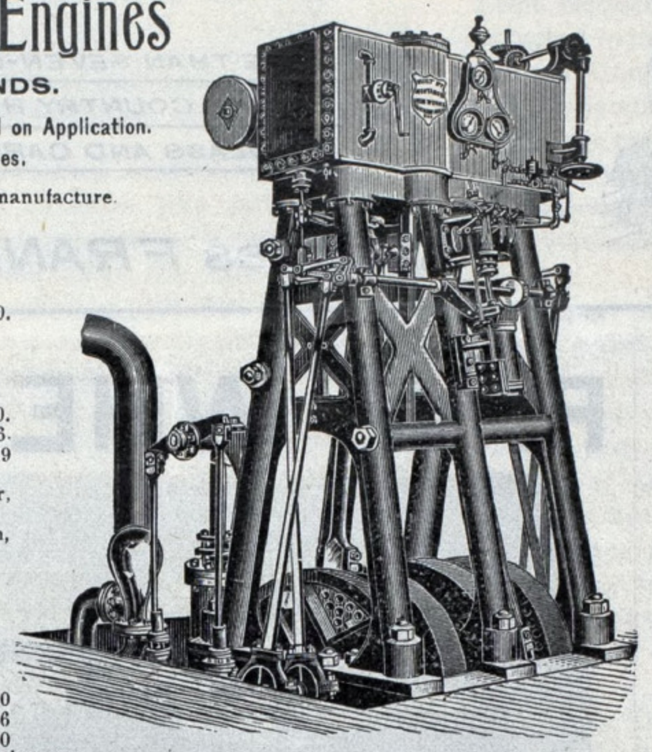

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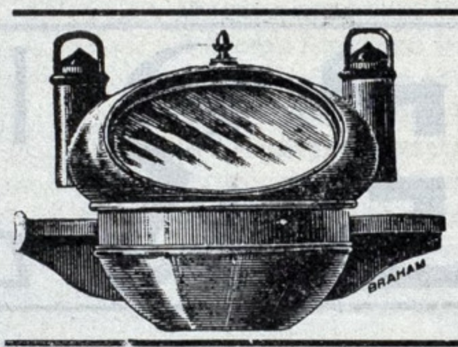

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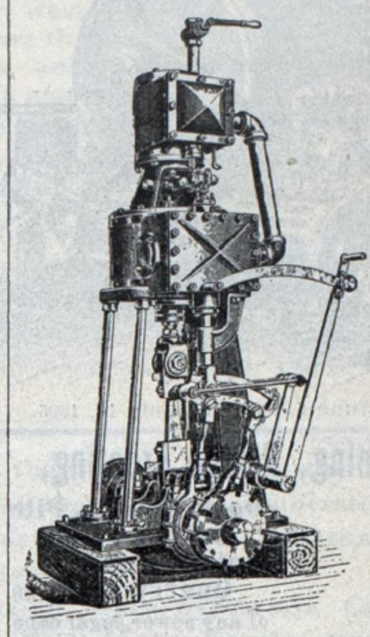

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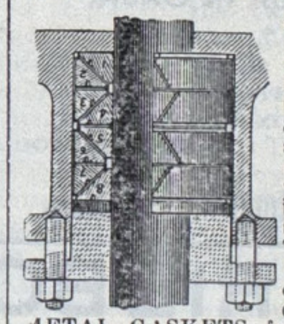

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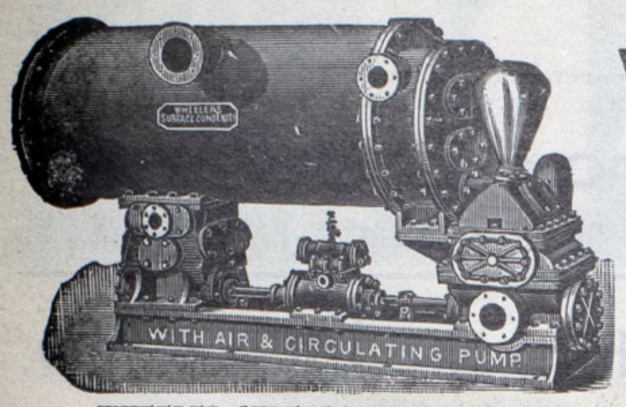

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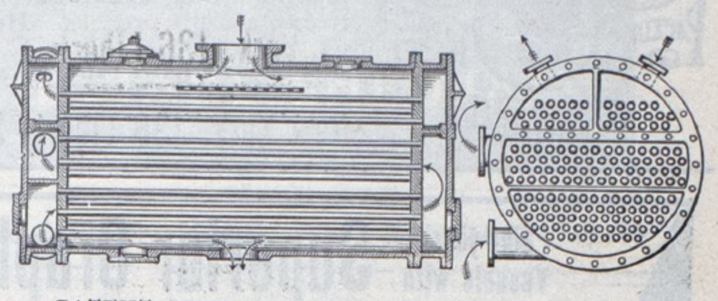

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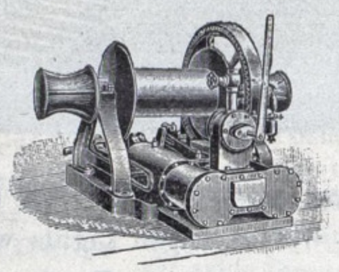

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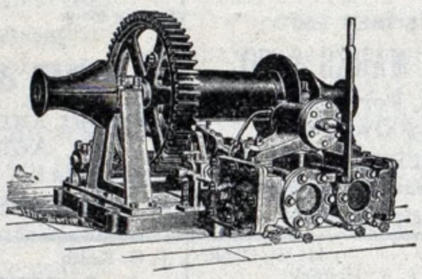

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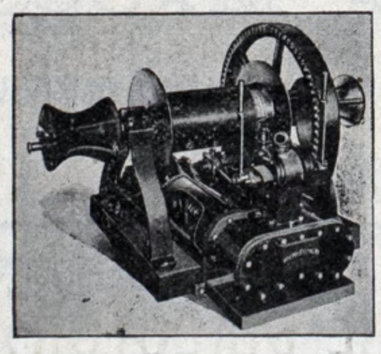

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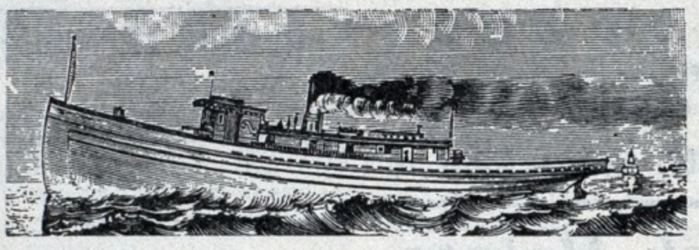

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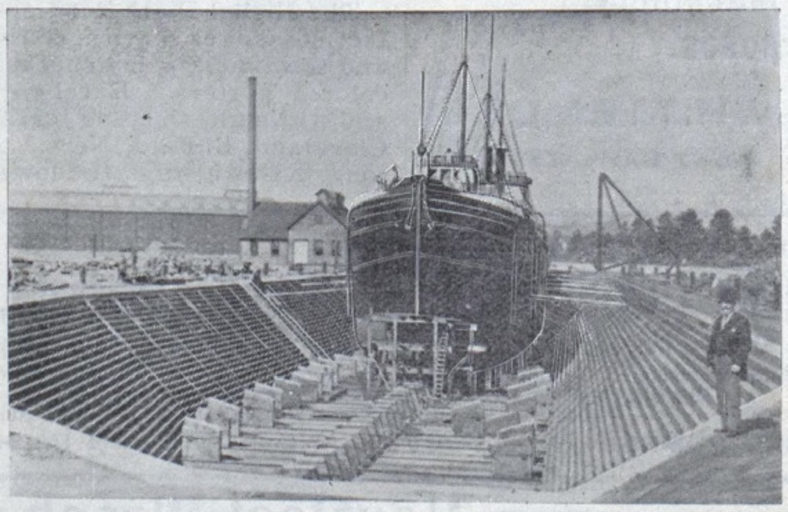

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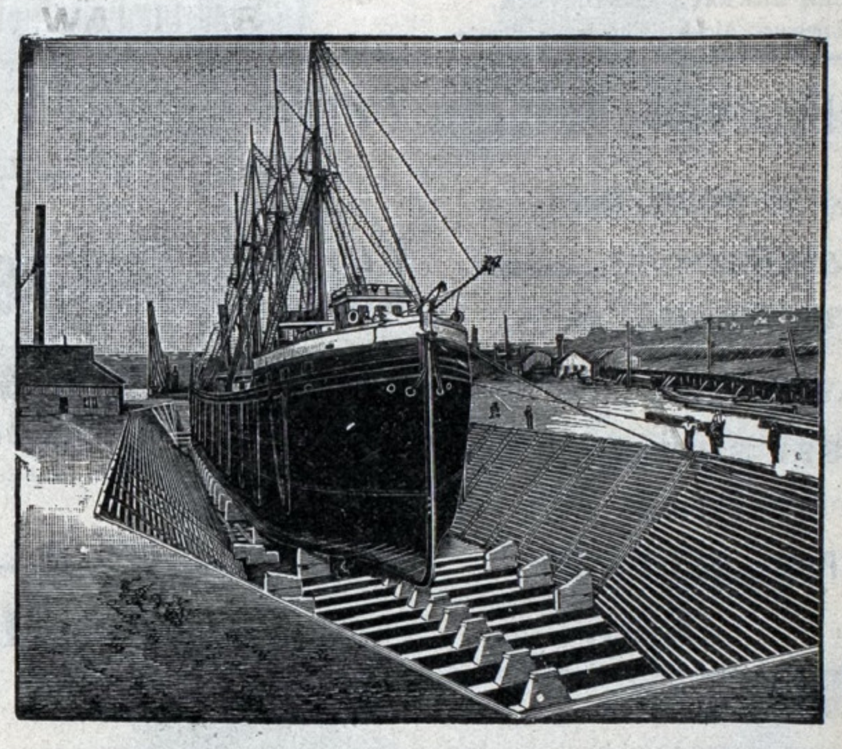

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